For Ways to Lower the High Cost of Accidents, See page 911.

DEC 26 1923

COAL AGE

McGraw-Hill Co., Inc. With which is Consolidated "The Colliery Engineer" 20 Cents per Copy

December 20, 1923

All Work

[Radial loads - Thrust loads - Resultant loads]

and no "Play"

[Adjustable for the wear that must follow motion]

TIMKEN

Tapered

ROLLER BEARINGS

©1923, By The T R B Co., Canton, O.

Saved from the Scrap Heap

How many of your cars that went on the scrap heap last year might have been saved if they had been carefully overhauled, and the necessary repairs made *in time?*

"A Stitch in Time Saves Nine" is an ancient platitude—but a true saying. A careful inspection of your equipment now, and the replacement of worn parts, will save you money, and prevent production losses.

Wheels—trucks—couplings—brake shoes and bands—track frogs and turnouts—dumping rigs—sheaves—Hockensmith can furnish any of them in a hurry; and you may be sure they are good ones!

BY INVITATION MEMBER OF
BE GUIDED BY THIS FOUNDATION
HONOR STRENGTH SERVICE QUALITY
RICE LEADERS OF THE WORLD ASSOCIATION
NEW YORK, U.S.A.

HOCKENSMITH
WHEEL & MINE CAR CO.

Penn, Pa.
(Pittsburgh District)

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 24 NEW YORK, DECEMBER 20, 1923 Number 25

Investment Engineering

COAL-MINE electrification has been rapid, its economies have been real and amazing; yet much has been done with a blind faith in the savings to be realized. Greater advantages are still possible. Many mines have only begun to electrify their machinery and install new labor-saving, high-efficiency, lower-cost-per-ton equipment. Mining companies which believe themselves completely electrified today will find themselves making new applications in the next few years. Again, since this type of equipment is out of date in from ten to eleven years, there are continuous big engineering and financial problems to solve each day.

Thus we find the financial questions involved in making a coal mine modern loom larger and larger. It becomes increasingly more necessary that the engineer better understand the investment side of his business; he must do his engineering from the financial point of view and ably present to his company executives his engineering proposals, which are sound only as they are founded on lower cost, safer coal production.

Herbert Hoover recently said: "The function of the investment banker is to find the money for the advancing of equipment of the nation. As science advances, it is the duty of the engineer to lead its promises up to the investment bankers." Here we have the urge upon the banker and the coal-company engineer. How can these big forces be brought together? A part of the answer lies in a better understanding of investment problems on the part of the engineer.

Wage Competition

ALREADY there is bitter complaint on the part of groups of operators paying the union scale of wages in the soft-coal fields that they are not able to compete with non-union coal at lower wages. It is a rumbling such as preceded the war of 1922 in these coal fields. It is difficult to understand how the comparatively small amount of wage reductions that have taken place in the non-union fields could have made the situation so acute as some profess to find it. The large groups of non-union operators are holding fast to the high scales; those making the reductions are small and relatively few in number, mainly, it appears, in Somerset and eastern Kentucky.

There are none so blind as those who will not see and such are those who blame all their lack of ability to sell on underpriced non-union competition. There is little statistical basis for such an alibi as yet, but how much stronger the disclaimers will be next spring if costs are really hacked down in southern West Virginia as in 1921-22!

And if the non-union producers can and do later on cut their costs by reducing wages, it will be because they can. The union operator who harbors any idea that he can by hook or crook, by any device or strategy gain the consent of the United Mine Workers to a reduction in the scale next spring is fooling himself. The organized soft-coal industry is plainly faced at best with a continuation of the present scale. We say *at best* advisedly, for the treacherous 10-per cent that Pinchot handed to the hard-coal miners, by common consent, darkens even that prospect. The most ill-advised move possible is for any group of union operators to commit themselves to a demand for a wage reduction next April. There is not the slightest sentiment in business today for an attempt to deflate coal wages at the expense of another 1922.

What is the answer then? If it does not lie in endless, pointless damning the other fellow it must lie in earnest seeking to get the union coal-mine worker to *earn* the high wage he now gets. If the problem of the coal operators were markedly different from the operators in other industry, then we might conclude that the coal producers were alone at fault, but that is not so. Organized labor the country over still feels its oats and is unitedly in opposition to any reduction in its war and post-war wage rates.

Trade-Commission Policy

JUST what the Federal Trade Commission hopes or expects to gain other than free advertising by its series of reports on anthracite prices is not clear. The statements are as misleading now as when first issued, for they stress the insignificant minority of premium-priced anthracite and glide over the normal priced majority. The institution of this series drew its inspiration from the White House. The President, it was reported at about the time the Coal Commission ceased to function, believed that the hard-coal trade needed airing, and to the Federal Trade Commission was assigned the mopping up job. The idea of the Federal Trade Commission always is to pick a culprit and roast him on a spit. The commission has not even the finesse of Pinchot, who before he launched his attack approached the anthracite operators with a proposal for lowering the retail price; a proposal that was illegal and therefore rejected.

American business has long since foregone the thought that the Federal Trade Commission has any intention of being helpful; the coal industry has come to expect it to be unfair. Whatever be the personnel of the Commissioners, the staff is the fountain head of ideas and inspiration for business-baiting prosecution. We have no criticism of the Trade Commission for proceedings instituted in respect to unfair trade practices, if and when the cases are instituted on some reasonable grounds. It would be the people's protection against high coal prices, or any coal prices, perhaps. But that is not all the Trade Commission indulges itself. Advantage is taken of every opportunity that affords to assail coal. These anthracite reports are but bi-weekly re-

hash of the same old story, without the critical discussion offered by the Coal Commission when it gave the same material to the public.

Is it the idea of the administration that such material will serve to lower the price of coal; that this is publicity that will tranqualize the market; that the Trade Commission is helping the industry, the government or the public by broadcasting the already well-known fact that some anthracite is sold at higher prices than the remainder, when the market will take it at those prices? Has advertising reduced in any way the volume of speculation on Wall Street or in Chicago on grain, or in Louisville on horse races? The margins of the middleman handling anthracite may be speculative, and away above normal, under certain market conditions. The Trade Commission is not simply giving publicity to that fact, but is seeking to establish a public opinion contrary to any free trade in coal. The Trade Commission wants the distribution of coal put under its supervision.

Function of Presidents

WHAT is the function of the president of a coal company? By that we mean not what he does but what he ought to do. Judging by experience of presidents as a class, they are principally interested in the "politics" of the coal industry and the selling of coal after it is produced. Exceptions there are, especially in some fields, and incidentally it may be remarked that they are among the best and most progressive of operators. Too many executives are today interested solely in the strike question, in sales, taxation and federal regulation.

For all their activities, the operators—the bituminous operators at least—have organizations; for strikes, their operators' associations; for sales, their sales organization; for taxation, their accounting department and taxation experts; for federal regulation, their National Coal Associations; for production, their field force. Consequently when well organized their business should conduct itself.

But somehow they grant that so-called autonomy only to the field force, and they busy themselves with the other activities, for no other reason apparently than that they are urban and do not require them to subject themselves with their urbanity to the discomforts of the mining town, the mine boarding house and the underground.

But is the field force autonomous? By no means. It is ruled with an iron hand. It may do almost anything so long as it produces cheap, salable coal and does not demand any expenditure of capital. Consequently, usually no experimenting and no purchases of new forms of equipment are permitted. The progress of invention passes along unheeded until some enterprising and real president adopts it, economizes thereby or makes better coal. Then at last the president of the average company gets interested and arranges to get what he should have had long ago. Or perhaps an explosion occurs and the field force gets co-operation as to constructional funds and operating expenditures that will make such hazards less menacing.

Many mine managers fear to advise the purchase of additional machinery or the inauguration of conservational or safety measures likely to show on the monthly cost sheet. They would seek co-operation from the president if he knew more than the one word "No."

The Future for "Too Many Mines"

TIME has a way of creeping up and catching some folks unawares. Time caught up with the overdeveloped anthracite industry of two decades ago. Time, smooth flowing time, easing from one year of trouble to another year of quiet, has brought the hard-coal industry a new set of troubles. None will say that having solved, at great cost and long effort, the problem of "too many mines" the hard-coal men are not up against other and as difficult problems.

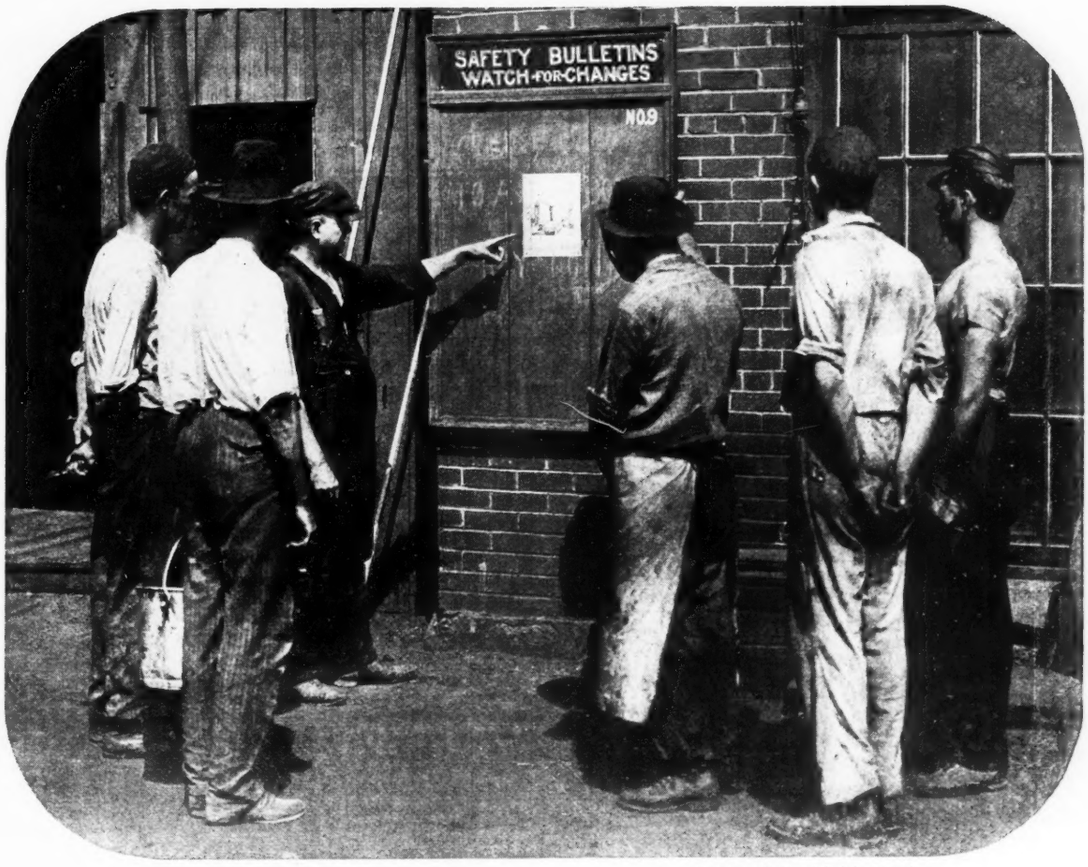
Depending on who does the guessing, estimates of overdevelopment in soft coal range from 25 to 100 per cent. We all recognize that the bituminous-coal industry is treading the mill over which the anthracite industry passed a decade or so ago. Development of the anthracite mines was checked; demand has overtaken production, putting the business on a profitable basis, as it should be. But being thus, new problems have been presented, serious because becoming acute in a period of general economic unrest and positive union-labor control.

And is the bituminous-coal industry about to profit by the lessons in anthracite? Much is different, but much is similar in this aspect of the two industries. There is definite push from the public—President Coolidge voiced it in his message—for consolidations in the soft-coal industry. The country is growing; it will not require long for consumption to overtake the productive capacity of all soft-coal mines that are at least reasonably efficient. It were well that the soft-coal industry look back over anthracite history and think ahead in soft coal to that time when "Too many mines" is a thing of the past. The problems of the future will be different from those of today.

Judge Gary is a forward-looking man—one reason why he heads the Steel Corporation. He recently said: "There are no substantial grounds upon which to base a thesis that in America the productive capacity of the country as a whole is in excess of the ability of the people to consume, and it is a sound business policy to build on the theory that consumption will continue to increase. The growth may be irregular, with innumerable waves; but these are of much less importance than the fact that over a period of years there is always a substantial increase. A man can provide against temporary depressions but cannot take advantage of increases in demand unless as a matter of business policy he has built up liberally his productive machinery."

It is all well and good to stem the tide of overdevelopment of coal but there must be no overlooking of the problems of the future such a program entails.

"IT IS NOT THOROUGHLY UNDERSTOOD in Washington why Governor Pinchot is insisting upon outside regulation of the anthracite industry when the State of Pennsylvania can do under its own power everything that he suggests. There are those who believe that the only way to meet the anthracite situation is to authorize a combination which will include all mines producing that type of coal in Pennsylvania."—*News Note.* That is just what Mr. Warriner said in his academy speech last month—"Certainly it is not sound public policy to transfer from experienced managers to the political arena the regulation and control of this industry until the managers have been given an opportunity to try and work out their problems under laws which permit collective action and self-correction."



Courtesy, National Safety Council

Safety Stunts Help Miners Protect Themselves

Reminders Should Be Unusual and Striking—Freshen Up the Bulletin Board with Drawings of Accidents at Mine at Which They Occur—Warning Cards in Pay Envelopes and Premiums for Foremen Also Help

"HOW can we make men protect *their own* lives?" It is an old lament. The Midwestern coal operator who gave voice to it as he scanned a fresh report of a fatal accident in one of his best protected mines is only one of thousands of conscientious employers who have wagged their heads helplessly over this puzzle of the age.

Miners are just like other workers. They do grow callous to danger—their own danger. No matter what their instructions, there are always a few who *will* open a can of powder by driving a pick point into it. No matter what the boss says, there are always a few who *will* be reckless with electricity. No matter about the instructions, or the boss, or common sense itself, there are always a few who *will* strike a light where gas may lurk.

"You can't get away from it," declares a safety engineer; "there always will be careless miners and there always must be a campaign for safety going on, no matter how discouraging an occasional case is, here and there. The more safety work is done, the more lectures are delivered, the more signs are posted, the smaller will grow the number of serious accidents. That is proven by comparative statistics covering recent years. Operators must carry on general safety work all the time, and then, on top of that, they should be forever striving to find new, fresh, striking ways to make the miner 'think safety.' The old tricks do grow stale with time."

Keeping the thought "safety" fresh in miners' minds is an art that gets a good deal of attention in many mining companies. R. M. Lambie, chief of the West Virginia Department of Mines, told the Mine Inspectors' Institute of America something about it at the last Institute meeting. In Mr. Lambie's state, there are several large companies whose effort along safety lines bears abundant fruit, and "stunts" of one sort or another are part of the effort.

Safety Work Prevents Many Accidents

Since 1917 safety work has been more at the fore than it was previously. Statistics prove that it has paid. In 1917 West Virginia mines employed 95,883 men and in 1921 the figure rose to 124,576, but the number killed dropped from 394 to 346, which means that only one life was lost for every 338 men employed instead of one for every 225. These figures mean something. Somewhere there was a sound reason for this saving of lives.

One reason was the marked shift from black powder

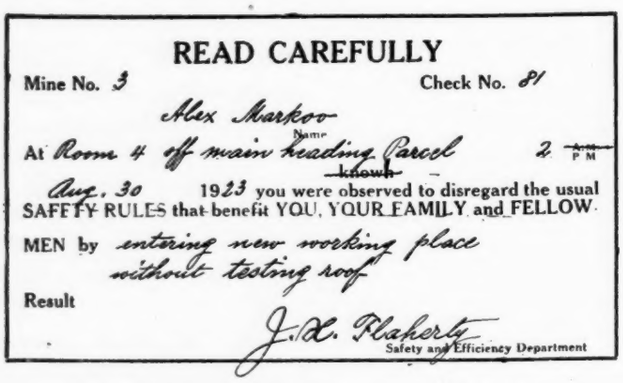
to permissibles. Between 1917 and 1922 the quantity of black powder consumed dropped off 253,383 kegs, which is a vast quantity of dangerous explosive. Permissible powders increased 1,183,777 lb. in the same six years, which had a good deal to do with reducing the number of lives lost by explosion. Explosion fatalities at Davis Coal & Coke Co. mines were reduced 75 per cent. In 1922 the state produced 232,000 tons for every life lost inside the mines. The annual average since 1883 is only 187,000 tons. Something is responsible for this great change for the better. It must be the safety work.

There are plenty of facts to prove that the mines in West Virginia in which safety is actively taught are least afflicted with death. For instance, though the state's total tonnage per fatality last year was 232,000, the Consolidation Coal Co.'s record is 749,600! Other companies also can show proud records. But the state is full of lesser mines where the words "Be Careful" are not so often dinned into miners' ears, and where safety precautions are not so prevalent. These pull down the average. Mr. Lambie's state is striding forward every year, however, and the work of the chief himself and his crew of state inspectors is an important reason why.

But what are some of these "stunts" used in West Virginia to make men "think safety"? Every one of them is aimed to awaken within men the knowledge that after all is said and done, after the company has installed every known protective device, after experts have sounded every possible warning and given all sorts of instruction, a man's safety depends only 20 per cent on all these and 80 per cent on himself.

One "stunt" has to do with pay envelopes. Every man takes a personal interest in what that particular envelope contains. In one company, if any official or miner is observed to disregard the usual safety rules or is known to have done so at any time during the preceding pay period, a card with red ink on it appears in his envelope, stating just what he did, and when and where he did it, and is signed by someone in the safety department. The reverse side of the card says: "Remember—safety first. Never again be the cause of receiving a similar card, but ALWAYS BE CAREFUL." The chances are the reminder in that pay envelope goes with that man through many a week to come.

A 3x6-in. tag plays a part in one big company's safety work. That company keeps careful safety statistics on the accident record of each of its mines. Each


READ CAREFULLY

Mine No. 3 Check No. 81

Alex Markov
Name

At Room 4 off main heading Parcel 2 AM PM
~~known~~

Aug. 30 1923 you were observed to disregard the usual SAFETY RULES ~~that~~ benefit YOU, YOUR FAMILY and FELLOW MEN by entering new working place without testing roof

Result

J. A. Flaherty
Safety and Efficiency Department

A WARNING IN THIS MAN'S PAY ENVELOPE

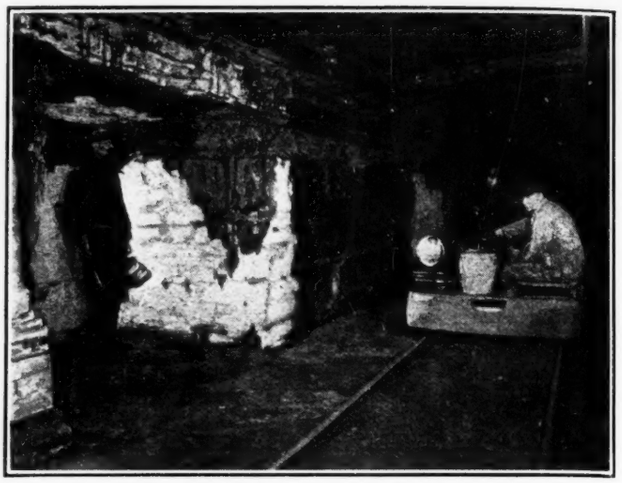
Alex Markov was observed entering a new working place without properly testing the roof. He got this card, with some of its message printed in red, warning him that he had disregarded "the usual safety rules that benefit you, your family and fellowmen." Perhaps he was a safer man after that.

C. W. & F.

ACCIDENT PREVENTION BULLETIN

NUMBER 5

The miner in the picture below has gotten into a manhole to let a trip pass so that should the motor or a car jump the track, he will not be hurt.



Always get into a manhole when you see a trip coming, but before stepping out again look for the rear marker or rear light to make sure that the trip has not come uncoupled. Also look back to make sure a second trip is not following the first. Many men have been killed or severely injured by runaway cars following a trip, or a second trip following the first.

ANOTHER SAFETY NOTE IN THE PAY ENVELOPE

An Illinois mining company uses a series of these safety lessons on small sheets stuffed into the envelopes once a month for several months at a stretch. Then there is a lapse of time before the next burst, for it will not do to overwork even a good idea lest it get stale.

month some mine is unfortunate enough to have the worst record for accidents. Immediately that mine is all aflicker with the 3x6-in. tags attached to cars, signboards, timbers, headframe, wash-house door—everything about the mine. The tags are printed in green, showing as their outstanding feature a big hand in a circle.

"Safety First," the old, old slogan, is on the palm of the hand. On one side the tag says "You are Judged by The Company You Travel In. Travel With The Safety Men; It Means Your Happiness and Safety." The other side says: "Do Not Remove This Tag. It Is Here for a Purpose." And every man in that mine knows what that purpose is. The tags remind them of that purpose for thirty days, or until they remove their mine from the "worst" proposition on the company list. Then all the tags are removed.

Cash is another weapon against accident. It may seem a doubtful policy to pay men to protect their own lives, but when that pay goes to foremen and assistant foremen who are directly in charge of the performance of men on the job, the objection is largely removed. These officials are being paid for protecting others—not themselves. After all, nothing speaks louder than good American dollars, so a premium system is used in one of the great coal mining companies' system of mines under which foremen can add as much as $25 and assistant foremen up to $15 a month to their pay.

In order to qualify for premiums, foremen and assistant foremen must not miss more than one working day in the month, they must have received and receipted for a copy of the company's "Synopsis of Instructions" on safety and they must have been examined by the company physician to prove their own physical condi-

tion. Also in order to collect the premium each one must have less than ten demerit marks against him. He gets ten demerits if during the month any man under him suffers a minor injury (causing the loss of seven days or more), twenty demerits for each serious injury and forty demerits for each fatality.

If a company inspector finds any dangerous condition existing in an assistant foreman's section of a mine, that assistant foreman gets five demerits, but the assistant foreman wins five merit marks for each month in which no dangerous conditions are found, and five more are credited if there are no accidents. Thus the man has a chance to wipe out his demerits. The foreman's account is charged with all demerits and credited with all merits of the assistant foremen under him.

An added premium for long-time safety service is provided in this clause of the premium rules: "Any mine foreman or assistant foreman who for six consecutive months is entitled to the monthly premium of $10 or $5 will, at the end of the sixth month, receive a special premium of $15 or $10 and for each month thereafter so long as his record is up to the requirements; but when his record does not come up to the requirements he again will have to make a clear record for another six months before he is entitled to a special premium."

Keeping "Punch" in the Bulletin Board

That old stand-by, the bulletin board, does its bit for safety at many a mine. The problem is: What should be put on it that does not get stale, that keeps the board forever interesting and that will put over the lesson of safety with punch?

One device is a picture of every accident. This does not mean a photograph. It means a blueprint drawing of just what happened, where and how, as viewed both from the side and overhead. These two drawings on each such blueprint tell the story even to a man who cannot read the description of the accident which is printed at one side. There is human interest in such sheets, and it is enough to draw a lot of attention to the mine bulletin boards.

A similar idea in the use of pictures on the bulletin boards is embodied in the plan of the Chicago, Wilmington & Franklin Coal Co., in southern Illinois. The names of the principals in each accident are not used, but whenever an accident of major importance occurs, it is described in a series of pictures drawn by company home talent on a single big sheet. This is posted at all mines.

For instance, a man loses a foot by using it to open the knuckle on a freight-car coupler as he was coupling up a string of empties. The artist draws four pictures. The top one shows the unfortunate man signaling for the cars to be shoved together. The second shows him trying to open the knuckle with his foot. In the third drawing, he is lying on the ground with his foot crushed in the couplers of the two cars and the last shows him extricated, minus a foot, surrounded by stretcher bearers and first-aid men.

"This accident, which occurred at our mines Feb. 10, 1921, could have been avoided if the coupler had been doing his work in the right way and had taken proper precautions. Better be safe than sorry. Use the proper methods!" says the type matter on the bulletin.

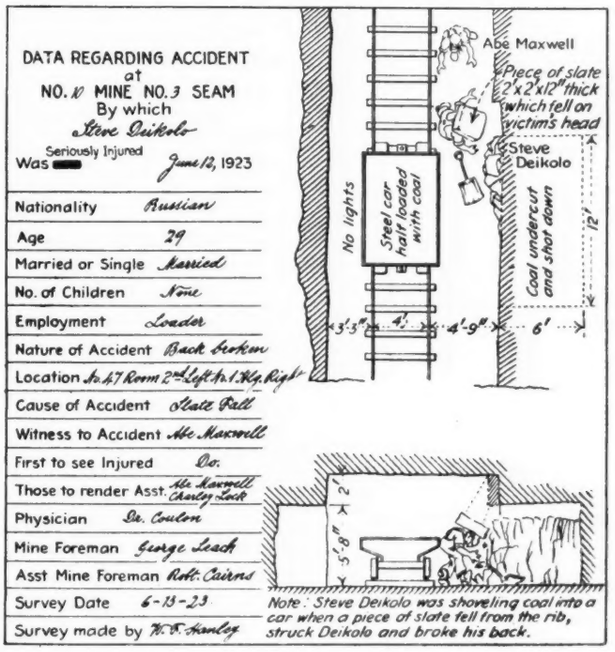
News interest is worked into blueprints for the boards at the United States Coal & Coke Co. mines in West Virginia and Kentucky. The company posts at the end of every month tables showing the safety standing of every mine. Comparisons are made with previous months and previous years so that a miner may know exactly where his own mine stands in the list and whether it is improving or slumping.

To keep the bulletin board ever changing, messages of all sorts are pinned up from time to time. "The wife of a careless man is ALMOST A WIDOW," says one, and it is a line which is not easily forgotten. Another was inspired by the game of "Put and Take." On a blueprint sheet were drawn six pictures of put-and-take tops, each showing one of the hexagonal sides of the top with its inscription "Put two," "Take one," "Take All," and the like. Each inscription was worked into a sentence thus: "TAKE ALL precautions for your safety," "PUT TWO hands on the hand bar when in the cage," "TAKE TWO knocks on the roof before you start work," "PUT ONE prop up before you TAKE ONE down," and so on. Another blue sheet says: "The only safety appliances which this company cannot furnish for YOUR protection are eyes that see and brains that think. They are the best safety devices known. USE them."

Don't "Nag," Especially on a Bulletin Board

There is plenty of safety service that mining companies can get out of the bulletin board; but how many of them make the board a live, appealing thing which grips men's attention? How many of them permit it to get all cluttered up with stuff of all sorts that distracts rather than attracts attention? How many of them put it in the right place and give it light enough? How many of them keep the board fresh and new? The National Safety Council spreads some good ideas about bulletin boards.

Three things every safety bulletin ought to do, or it

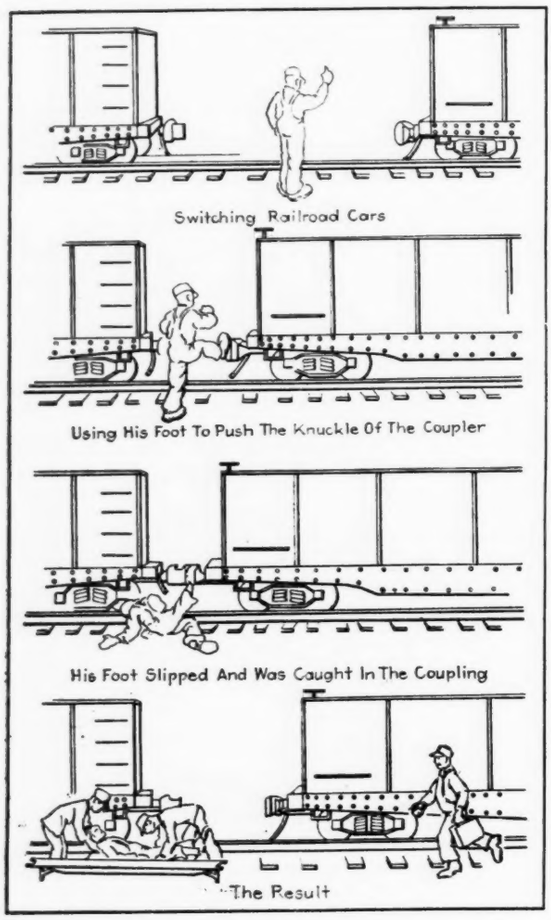

DATA REGARDING ACCIDENT
at
NO. 10 MINE NO. 3 SEAM
By which
Steve Deikolo
Was Seriously Injured June 12, 1923
Nationality Russian
Age 29
Married or Single Married
No. of Children None
Employment Loader
Nature of Accident Back broken
Location No. 47 Room 2nd Left No. 1 Hdg. Right
Cause of Accident Slate Fell
Witness to Accident Abe Maxwell
First to see Injured Do.
Those to render Asst. Abe Maxwell Charley Leach
Physician Dr. Coulon
Mine Foreman George Leach
Asst Mine Foreman Robt. Cairns
Survey Date 6-13-23
Survey made by W. E. Stanley
Abe Maxwell
Piece of slate 2'x2'x12" thick which fell on victim's head
Steve Deikolo
No lights
Steel car half loaded with coal
Coal undercut and shot down
12'
3'3"
4'
4'-9"
6'
5'-8"
2'
Note: Steve Deikolo was shoveling coal into a car when a piece of slate fell from the rib, struck Deikolo and broke his back.

AN EFFECTIVE WAY TO TEACH A SAFETY LESSON

The whole story of how Steve Deikolo's back was broken by a chunk of slate falling on top of his head is told in these two home-made drawings and the information entered in the blanks at the left. The poster does not need to say that it is dangerous to begin loading out coal from a freshly cut and shot place without making sure that there is no loose top or overhang. Every miner reading the bulletin gets the lesson.

C. W. & F. SAFETY BULLETIN

This accident, which occurred at one of our mines February 10, 1921, could have been avoided if the coupler had been doing his work in the right way and had taken proper precautions


Switching Railroad Cars
Using His Foot To Push The Knuckle Of The Coupler
His Foot Slipped And Was Caught In The Coupling
The Result

Better to be safe than sorry; use the proper methods

HOME TALENT OFTEN MAKES THE BEST POSTERS

This picture story, showing how a certain man in the employ of the Chicago, Wilmington & Franklin Coal Co. lost a foot, was posted on all the bulletin boards of the company just after the accident, when its message might have the deepest effect upon the rest of the company's men. Great expense is not essential to the making of good safety bulletins.

is not worth posting, the Council says. It should stimulate safety thinking, create good will toward safety work and warn miners against unsafe practices. The whole bulletin should be such that it can be read at a glance—or practically that. Picture and text must be vivid and directly to the point. The bulletin must aim to get over *just one idea.*

Directness, however, does not mean telling readers bluntly just exactly what you mean. It is more effective to frame the message in such a way that the reader infers its meaning. For instance, if a man has been hit on the head with a sledgehammer head that flew off the handle, the bulletin based on this accident should not say "Don't use loose-handled sledges" and let it go at that. Better, it should say, "Nobody has ever been smart enough to think of a good excuse for using a sledge with a loose handle; there isn't any." The reader must make a trifling mental effort in order to get the lesson. For that reason, he remembers the lesson longer.

Another thought for bulletin makers is: Don't harp continually upon the word "careless" lest the miner eventually get sore. Bulletin results will thus be made less effective. Also it is generally accepted nowadays that revolting pictures of accidents are not good because they tend to scare a man instead of instruct him. Instilling perpetual fear within a man does not necessarily make him safe. Rather it reduces his efficiency and makes him flighty and more likely to have accidents. Therefore good safety bulletins should be positive in tone rather than negative.

"Put a good man in charge of bulletins," says the Safety Council. "Let him strive always to make his bulletins as local as possible. Free use of his own camera is always a good thing. He will want the bulletin board in some place where men congregate rather than at some gate where they merely stream past. He will keep changing everything on the board from day to day and he will put very few things on at a time. If he learns a few of the main principles of advertising display so as to be able to make each bulletin an attention getter, if by no more complicated an expedient than the proper drawing of a heavy line or two or the skillful use of a piece of colored crayon, his service will be of greater value."

Good bulletins and cards and pay-envelope stuffers—devices like these are answering, in a way, the lament of the operator who wonders how to make his men protect their own lives. There are scores of other special methods, all backing up the basic safety work of instruction, and each fresh crop of "stunts" helps make men "think safety." When miners do that, accident rates drop markedly.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of November

Ports	Railroads	1923 Cargo	1923 Fuel	1923 Total	1922 Cargo	1922 Fuel	1922 Total	1921 Cargo	1921 Fuel	1921 Total
Toledo	Hocking Valley	5,003,169	150,612	5,153,781	3,195,480	91,530	3,287,010	4,417,407	115,981	4,533,388
	N. Y. C.-Ohio Central Lines	1,179,147	36,815	1,215,962	848,157	27,141	875,298	1,094,976	32,070	1,127,046
	Baltimore & Ohio	2,861,500	83,889	2,945,389	2,814,496	75,895	2,890,391	2,550,430	78,085	2,628,515
Sandusky	Pennsylvania	3,005,405	95,418	3,100,823	2,695,899	97,303	2,793,202	1,853,148	52,138	1,905,286
Huron	Wheeling & Lake Erie	1,471,905	58,169	1,530,074	413,682	16,753	430,435	1,577,500	45,468	1,622,968
Lorain	Baltimore & Ohio	3,643,163	194,893	3,838,056	1,798,619	90,969	1,889,588	2,523,920	102,449	2,626,369
Cleveland	Pennsylvania	1,850,573	198,975	2,049,548	1,024,802	91,394	1,116,196	2,062,722	91,364	2,154,086
	Erie	739,025	31,920	770,945	381,903	14,208	396,111	359,981	12,782	372,763
Fairport	Baltimore & Ohio	880,389	80,118	960,507	.....	.....	.....	.....	.....	.....
Ashtabula	New York Central	3,322,902	253,537	3,576,439	1,472,339	86,792	1,559,131	1,125,792	62,214	1,188,006
	Pennsylvania	2,083,379	91,037	2,174,416	1,623,878	88,638	1,712,516	2,300,210	78,029	2,378,239
Conneaut	Bessemer & Lake Erie	2,781,553	240,553	3,022,106	1,546,725	61,850	1,608,575	1,462,450	20,195	1,482,645
Erie	Pennsylvania	717,240	93,489	810,729	198,110	70,383	268,493	1,016,447	66,134	1,082,581
Total		29,539,350	1,609,425	31,148,775	18,014,090	812,856	18,826,946	22,344,983	756,909	23,101,892

Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.

What Will It Cost? What Will It Earn?

By Charles M. Means
Consulting Engineer, Pittsburgh, Pa.

THE engineer of today must solve business problems as well as those pertaining to engineering. In this article Mr. Means tells the engineer how to arrange his report, revealing important points in presenting a proposal and in setting up the engineering data.

ELECTRICAL engineers employed by coal companies frequently make reports intended to show the value of proposed changes or extensions to the electrical system. The report is carefully made up and submitted to the particular officer responsible for expenditures and quite often the engineer is not further advised as to the outcome, in which case he naturally feels that his work has not been appreciated.

In the course of my work I have had occasion to review many such reports and a considerable number were so arranged as not to admit of an analysis except by an engineer. There are only two questions that are really important to the official responsible for finances and these are: How much will it cost, and what will it earn? Anything else is subsidiary to these two items. If the answers to the above questions are hidden away in a mass of figures and calculations they may mean very little to one not familiar with engineering problems. If the change under consideration is one where monetary gain is a considerable item and it is shown clearly in the report, the official responsible for results cannot afford to allow it to lie quiescent as he never knows when it will return to haunt him.

I have had occasion to make up reports on existing or proposed electrical systems for more than a hundred properties throughout the country and have had ample opportunities to observe the reactions from the various arrangements of data compiled.

Recommendations Should Suit Conditions

It is important that all information be obtained as to present operating costs and how they are incurred, all engineering data having a bearing on the problem under consideration, together with a complete personal examination of the existing local conditions and a careful study of the personnel of the organization. It might seem that a study of this last item is not essential, but in reality it is fully as important as any other phase. It is economically wrong to recommend any arrangement that cannot be successfully handled by the men employed at the mine. It is infinitely better to install equipment that the present employees can operate than to try to get new men.

With all data available, the problem of the engineer is to work up a report showing clearly all the details of the proposed changes. Herewith is shown a table of contents (Fig. 1) which appears as the first sheet of such a report. The next sheet is a short introductory statement outlining what the report is intended to cover. The following sheet (Fig. 2) is really the first page of the report and contains all the essential information that is required by a board of directors.

The first item may cause quite a shock to the board members, but they are in much better spirits to recover from it than if they had been required to read through the entire report before arriving at the final figure. The second item has a rather soothing effect and by the time the members reach the subsequent figures on the page they are fully reconciled to the apparent high first cost. The figures shown on this page must be supported by thoroughly reliable data and calculations appearing on the subsequent pages.

Inasmuch as a report such as described is intended for those responsible for the financial investment and returns, it is essential that the entire arrangement of the report be such as will show all details in the sequence of their importance with respect to the investment and returns. By showing cost and earnings on the first page and a duty cycle curve of a proposed shaft hoist with the root mean square horsepower calculations on the last page, an ideal arrangement is obtained. The average director of a coal-mining property is vitally interested in cost and earnings, but has no more interest in the root mean square horsepower than he has in the behavior of electrons in an atom of helium.

It also is important that all bookkeeping and engineering details be incorporated in the report so that the results indicated may be completely checked and the possibility of errors eliminated within the limits of certain data which must necessarily be assumed. The report also will be used as a check on the cost of various details as the work progresses. Such a report

The Kilowatt Coal Mining Co.

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FIG. 1—WHAT THE REPORT SHOULD CONTAIN

THE KILOWATT COAL MINING CO.

Summary

Total cost of proposed equipment erected and ready to operate		$195,452.00
Net saving per year effected by change		148,256.25
Deduct for interest, taxes, depreciation and insurance	$29,317.80	
Deduct for added labor	7,400.00	
		36,717.80
Net saving per year		$111,538.45
Net saving per ton produced		0.147
Net saving during life of property		$1,115,384.50

Note:

The output is taken at the rate of 750,250 tons per year as produced during 1922, which implies an active life of ten years for the property. The savings indicated will vary as the yearly output varies from that of 1922.

No salvage value is taken into account for the equipment replaced nor for the new equipment at the end of the amortization period of ten years.

FIG. 2—FINANCIAL STATEMENT OF PROPOSED PROJECT

is extremely valuable to any concern contemplating changes involving considerable expenditures of money, as it supplies a tangible starting point, removing many of the uncertain elements and indicating whether or not such expenditures are fully warranted.

Mortality Among British Coal Miners In Relation to Output

During the ten-year period 1913-1922, at the mines in Great Britain operating under the Coal Mines Act, the average annual death roll was 1,243, representing a death rate per thousand persons employed of 1.15, the average number of deaths per million tons of mineral raised being 4.92. During this period the annual average number of persons employed was 1,091,391, and of mineral raised 251,454,646 tons, the figure for coal being 241,081,755 tons, or 220 tons per employee.

Last year, as appears from tables prepared by the Chief Inspector of Mines, the mineral production was 255,971,696 tons, coal being responsible for rather more than 249,500,000 tons, and the persons employed numbered 1,162,754, while the deaths from accidents totalled 1,105, representing a death rate of 0.95 per thousand persons employed, the deaths per million tons of mineral raised working out to 4.32. The record for 1922 may therefore be said to be favorable when it is compared with the average for the last ten years. As the Secretary for Mines expressed it, "the picture is not one of unrelieved gloom." The tonnage per person was fully maintained.

THE COAL MINES in the Twentymile district of Colorado, according to a report by the U. S. Geological Survey, have been developed since the Denver & Salt Lake (Moffat) R.R. was extended into this district, in 1906. The coal has become widely and favorably known as an excellent fuel for both manufacturing and domestic use, but the development of mines has been greatly hampered by inadequacy of transportation facilities and by the fact that all the coal reaching the market had to be hauled up steep grades over one of the highest passes in the Rocky Mountains.

The Miner's Torch

The Children at Our Mining Camps

I HAVE just finished reading an article written by a woman who has visited a number of coal-mining camps to see what our mining companies are doing for the miners' children. It is a terrible picture that she paints and we are almost led to believe that if the men and women of the next generation have to spring from these mining-camp children, all of our schools and churches will be useless within two generations.

With the description which she gives of the things that she saw we cannot quarrel, for anyone who has lived much in mining towns in different sections of the country must agree that her sketches are true to life; but there be men living today of middle age and beyond who were raised in mining camps where conditions were worse than any to be found in mining camps of today, and these men are good citizens and some of them have even attained to positions of trust and eminence.

Things are not always as they seem. I recall an incident that happened about twenty-five years ago. I was acting as guide to a director of the company for which I worked, showing him around one of the mining camps. "Is this camp typical of all our camps?" he asked me, and when I replied in the affirmative he assured me that he was ashamed of his connection with the company. "Why," he said, "you must be breeding a race of anarchists here. Such smoke, such odors, and My God! such pitiful looking children." That camp has long since been abandoned, but I occasionally meet some of the children now grown to manhood and they are not anarchists.

Miners move around a good deal and they are out of employment quite often and they are not over-particular about the dress and the manners of their children; furthermore, the tipple often sends forth clouds of dust. Any visitor to a mining camp will discover these things and be impressed by them. But there are other things that ought to be taken into consideration before suggesting that our mine owners be hanged and quartered.

Mining villages have to be built where there is coal to be mined, which means that they are often miles from the main line of a railroad, sometimes located in gulches and at other times half way up a mountainside. Children on ranches and in logging camps or even on our farms often have a harder time in every way than the children of our miners. And if you want to find children who have fewer advantages than those of our miners, go to some of the villages around our large cotton mills.

In the same mail that brought me the article which I have discussed above, I received an article dealing with "welfare work"—so called—and its author was of the opinion that the matter had been overdone by most of the larger companies and in future many companies would expect their employees to initiate movements having to do with education, gardening, social service, etc. This author argued that the workers are beginning to resent the attitude of the employers, and that with reason.

So there you are—you can take your choice.

Belt Conveyors Well Suited For Hoisting Coal From Shallow Mines

In Most Cases Any Coal Under Less Than 225 Ft. of Cover Can Be Hoisted by This Means — When Depth Exceeds 120 Ft., Two 500-Ft. Units Should Be Used in Tandem

By Alphonse F. Brosky
Assistant Editor, *Coal Age*, Pittsburgh, Pa.

SOUND advice for the mining engineer is the dictum: "Hoist coal with belt conveyors wherever the depth of the seam, the nature of the material to be excavated and retained, the daily tonnage to be handled and the life of the plant favor such a method." It must be remembered, however, that the seam should not be too deep; the material over the coal should not be too loose or water-bearing and the daily and total tonnage must justify the greater expense involved in the construction of a slope.

"Slope-conveyor hoisting" is a comparatively new term in the vocabulary of the coal industry. By overlooking the possibility of the slope conveyor when planning for the landing on the tipple of coal from beds that do not outcrop, engineers have passed by many opportunities which would have lowered the costs of underground transportation. The usual hoisting methods tie the mine management hand and foot, for, with them, only with difficulty can the output of the mine be increased.

The congestion of traffic at the mine opening delays the return of trips to the working entries and adds considerably to the uncertainties of transportation. A shaft mine is much like a big bottle with a small neck. From it the coal emerges in a broken and uncertain stream. Dispose of the coal as quickly as it arrives at the bottom landing, and the traffic will move freely. An all-around saving can be made if a belt conveyor and a slope are provided, with the former delivering the coal direct to the shaker screens on the tipple.

In other industries moving belts have been put to extensive and varied use for carrying raw and finished materials. Many are used in anthracite breakers; they are indispensable in byproduct-coke plants, in chemical plants and in the rockhouses and concentrating mills of the ore regions. Belts of many sizes are performing efficiently elsewhere and serving better than expected the purposes for which they are installed.

In the immediate future the bituminous-coal industry will find more numerous applications of belt conveyors than at any time hitherto. Mine mechanical engineers acknowledge the usefulness of such conveyors in and about tipples, and power-plant experts recognize their efficiency in transporting coal from storage piles to bunkers. On the strength of close observation of level and inclined-belt conveyors in carrying coal, iron ores and even more abrasive rocks, mining engineers now see opportunities to simplify the operation of hoisting coal to tipples from comparatively shallow buried seams.

Uses of belt conveyors in the Lynch tipple and dumphouses of the United States Coal & Coke Co., in Kentucky, should assure us of their practicability. The permanent tipple, which has the semblance of an anthracite breaker, was completed in the early part of 1921.

Conveyor units leading from two dumphouses to the tipple have handled to date more than 4,000,000 tons of run-of-mine coal. Superimposed belts in the same galleries have carried a due proportion of mine refuse. One coal conveyor is 387 ft. long and another 404 ft. Both are 48 in. wide and travel on a slope of approxi-

Paper delivered, Dec. 4, at Huntington, W. Va., before the West Virginia Coal Mining Institute.

Headpiece shows tipple and slope of the Aluminum mine of the United States Aluminum Co. The upper Freeport seam lies only 60 ft. below the railroad tracks.

mately 18 deg. at a reduced speed of 156 ft. per minute. Traveling at maximum speed their capacity will be 1,000 tons of coal per hour each.

The two slate belts just mentioned also are 48 in. wide, move at a speed of 300 ft. per minute and have a capacity of 200 tons per hour each. These discharge at a junction tower onto the main 48-in. slate belt, which has a speed of 475 ft. per minute. The latter is 686 ft. long on a slope of 18 deg. and leads to a slate dump on the mountainside. All these belts and numerous shorter ones used for many purposes are driven by slip-ring induction motors aggregating only 720 hp.

The Lynch belt installation is proving to be highly dependable, as judged by results obtained. One can conceive of no other methods to accomplish more satisfactorily the duties of the units at this plant. True, the belts require regular attention, but any other kind of equipment for the same purpose likewise has to be carefully maintained. The job at Lynch points the way to possible installations involving the hoisting on slope conveyors of large and small tonnages of coal from buried seams.

Imagine the 686-ft. slate conveyor transposed from its present position in daylight into a slope tapping a coal seam which lies 135 ft. below the surface. The change would allow 75 ft. for tipple height and dumping facilities at the bottom of the slope. And it would afford a means of hoisting over one belt as much as 830 tons of coal per hour when traveling at the rate of 450 ft. per minute.*

Traveling at the speed specified, the belt would carry a load of about 20 tons of coal. Possibly the splices would not carry so great a load. In that case the rate of feed could be reduced to distribute a load of 14.5 tons of coal over the length of the conveyor. That is the load recommended by belt experts for 48-in. belting traveling at a speed of 450 ft. per minute on a 500-ft. conveyor unit.

The main coal conveyors at Lynch, with exactly the same characteristics, are calculated to carry a load of 14.3 tons. Carrying a load of 14.5 tons, the belt would transport coal at the rate of 675 tons per hour. Thus is a 5,400-ton hoisting layout in the making.

A slip-ring induction motor no larger than 100 hp. would be sufficient to drive the conveyor. The main slate conveyor at Lynch is driven by a 100-hp. motor. At the Kinloch mine of the Valley Camp Coal Co., in Pennsylvania, a 150-hp. motor drives an apron conveyor weighing 40 tons, which carries a load of 40 tons of coal, is 430 ft. long and on a 30-deg. slope.

Consequently one is conservative in assuming that a 100-hp. motor would be of ample size to drive the 686-ft. conveyor carrying a load of 14.5 tons of coal. Undoubtedly, belt conveyors in slopes will show a saving in power when compared with cages or skips under like conditions.

Much in the choice of hoisting by slope conveyors in preference to cages or skips depends upon these four closely related factors: The nature of the overburden in which a slope must be sunk, the depth of the seam, the first cost and the production desired.

Where the cover is as much as 200 ft. thick and composed chiefly of loose ground or strata of rock which bear an abundance of water, the sinking and lining of a slope would be impossible or otherwise very costly. In the last event only a large production would justify the expense. In solid cover a slope may be sunk and lined without serious difficulty but here again the desired output must influence the choice.

In general the depth from which coal should be hoisted by belts is governed by the output desired.. By placing two 500-ft. conveyor units in tandem, a rise of more than 300 ft. can be obtained. Coal from seams lying at depths of 225 ft. can be hoisted by means of such an arrangement at the same theoretical rate—5,400 tons in eight hours—as that of the single-unit conveyor mentioned earlier in the paper.

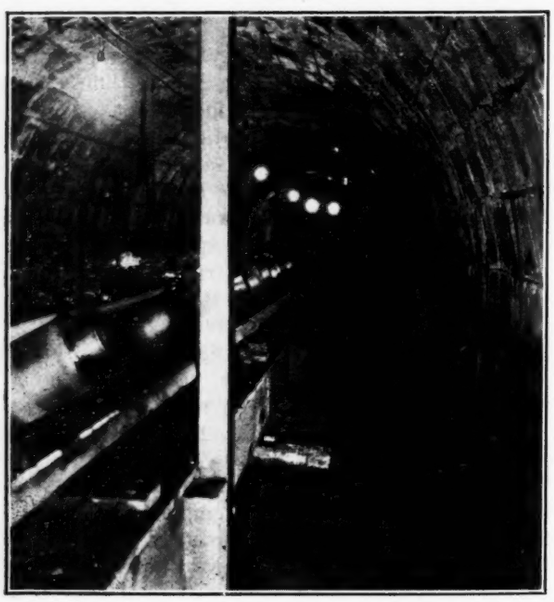
That is precisely what the Hudson Coal Co., of West Virginia, proposes to do at its Indian Creek operation, near Morgantown, W. Va., where the Sewickley seam is to be mined at a depth of about 275 ft. The total rise of the two conveyor units in tandem being about 350 ft., each unit will have to be about 550 ft. long, if the slope is 18 deg. This mine is being planned to produce 4,000 tons of coal per day.

The trend of present-day opinion is that the depth from which coal may be economically hoisted by means of slope conveyors ordinarily will not exceed 225 ft. That depth will require two 500-ft. conveyor units in tandem on an 18-deg. slope, as already stated. It is possible, nevertheless, to hoist economically from slightly greater depths by means of longer conveyor units, as pointed out in the case of the proposed Indian Creek operation of the Hudson Coal Co. Who knows? In the future we may find it economical to hoist from depths of 300 ft., using three conveyor units in tandem or 400 ft. with four such units. Only a very large production, however, could warrant these extremes.

On the depth of the coal seam below the surface hinges the application of slope conveyors for hoisting small daily tonnages. Wherever slope-sinking operations are easy, the cover is less than 100 ft. thick, and the mine is to produce 2,000 tons of coal per day, hoisting by belt might be preferable to cage hoisting. Most 1,000-ton mines in coal 50 ft. below the surface are best served by belt conveyors.

The total first cost of sinking a slope and installing a conveyor may be more or less than that of shaft and

*Based on table in Marks' Mechanical Engineers' Handbook.

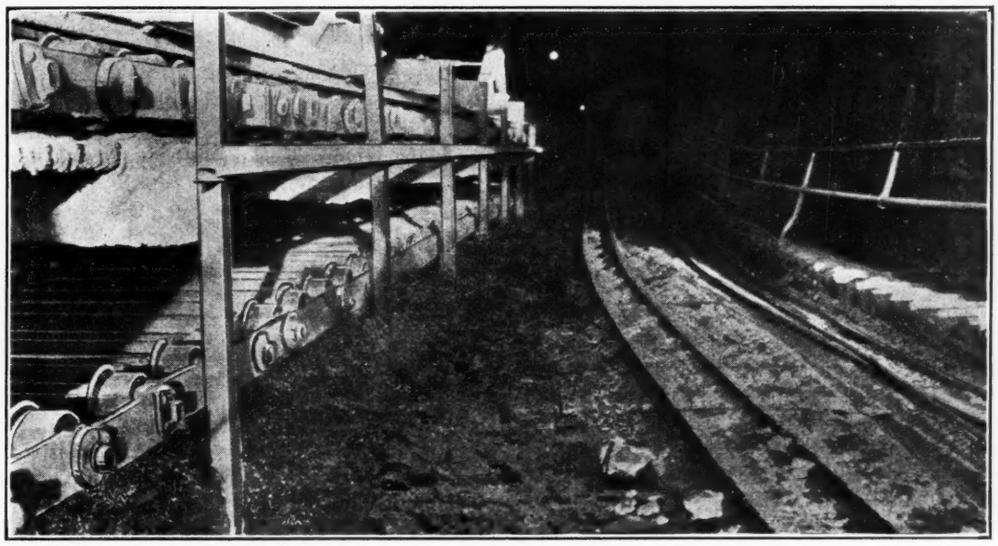


CONVEYOR IN TILE-LINED SLOPE IN LEWIS MINE

Where, as in this case, the length of the conveyor is less than 250 ft. and the tonnage of coal carried by it is not more than 2,500 tons per shift, the base of the conveyor can be built of wood at low cost. This arched slope is lined with tile, the cost of this type of construction being two-thirds that of concrete.

A 430-Ft. Pan Conveyor

At the Kinloch slope. Because so long it must necessarily be made of heavy material. This conveyor weighs 40 tons and carries an equal weight of coal. It is driven by a 150-hp. motor, but one of 100-hp. would carry the average load. When this conveyor was installed mining men shook their heads. It has proved after five years of service one of the most efficient devices in the industry.



cages. The cost per foot is greater for sinking a shaft than for a slope. But when sunk at 18 deg. a slope is nearly three times as long as a shaft of the same depth. For this reason the cost is more for a completed slope than for a shaft at the same location. That factor is fixed. On the other hand, slope equipment will in most cases cost less than shaft equipment.

Hoisting by means of self-dumping cages would be a better arrangement if only 2,000 tons of coal per day were required from a seam lying at a depth of, say, 200 ft. The first cost would be less than that of an arrangement involving a slope conveyor. Primarily, the greatest merit of a slope conveyor is its continuous performance, which makes for a continuous dumping schedule on the slope bottom. It is best suited to a mine having a large production.

It is readily apparent why large tonnages may be handled with greater efficiency by a belt conveyor than by cages or skips. As rapidly as coal is dumped into bins it is fed onto the conveyor. Properly functioning skips do not retard the rate of dumping, but they are much more likely to get out of order. The added cost of skips and their more complicated bottom layout favor the use of belt conveyors.

The slope conveyors now in actual use are giving excellent service. The installation at the Kinloch mine of the Valley Camp Coal Co., at Parnassus, Pa., is outstanding because this mine ranks on merits of production as one of the "Big Three" in the Pittsburgh district. Its actual daily output is 3,400 tons. Though a pan conveyor is used, the arrangement has many features common to belt conveyors. Its reliability is indicative of what one can expect when belts are used.

At the Kinloch mine a 30-deg. slope having a length of 430 ft. strikes the Thick Freeport seam at a depth of 150 ft. below the slope mouth. It is wide enough to accommodate a 60-in. pan conveyor, a mine track for materials and slate and a stairway for man travel. The conveyor is fabricated heavily, as it must be, weighing 40 tons and carrying a load of coal equal to its own weight. Even so, a 150-hp. motor is sufficiently large to move the conveyor and coal at the rate of 75 ft. per minute. The capacity of the unit is 475 tons per hour. A double track extends 500 ft. from the tail of the conveyor. The arrangement for handling trips is like that generally used on the surface at a drift mine, a kickback and two car hauls serving their customary purposes. Six men are employed on the bottom for the usual duties of uncoupling and coupling mine cars, dropping them to the dump, spotting, taking checks and dumping. A crossover dump empties the mine cars into a 9-ton chute pocket, from which the coal is fed to the main conveyor by means of an apron feeder.

The most notable feature of the dumping and hoisting arrangement at this mine is its operating continuity, for three 2½-ton mine cars are dumped in a little less than a minute. For this reason only 600 mine cars are required for the haulage of 3,400 tons of coal, though the mine is well developed.

Slope hoisting, therefore, like skip hoisting, has the advantage over hoisting by means of cages in that mine cars are dumped at the foot of the slope and are immediately available for use, which means, or should mean, that fewer mine cars are required for a given output. Consequently there should be less congestion on the bottom.

Only once in a period of five years has a long delay in transportation been caused at Kinloch by the breaking down of the pan conveyor. In that specific case the delay lasted several hours. Belt conveyors should do as well, and probably will, providing they are watched carefully and defects repaired immediately in off-shifts.

A typical application of belt conveyors for hoisting from shallow depths is made at the Lewis mine of the Hudson Coal Co., near Clarksburg, W. Va. The conveyor from tail to head rises 83 ft. in a distance of 247 ft., forming a slope of 18 deg. A 75-hp. motor is reduced by gears to move the belt at the rate of 250 ft. per minute. At that speed the capacity of the conveyor is 250 tons per hour. The same motor will drive the belt at a maximum allowable speed of 500 ft. per minute to carry 500 tons per hour.

An example of an extreme application of slope conveyors for hoisting coal is the installation at the Aluminum mine of the United States Aluminum Co., near Pittsburgh, Pa. The site of the mine plant is on the bank of the Allegheny River. An intervening railroad prohibits the bringing of mine cars to the river tipple from the Upper Freeport seam, which outcrops at about the level of the railroad track. The problem was solved by erecting a conveyor gallery at tipple height across the railroad tracks to connect with a gently inclined slope which penetrates the hill. The belt is 30 in. wide and 180 ft. long, driven by a 25-hp. motor at a speed

of 270 ft. per minute. The capacity of the conveyor is 195 tons of coal per hour.

No better arrangements could be made for bringing coal to the surface at the Lewis and Aluminum mines. Hoisting coal up shafts from depths of 50 ft. is not practicable. Rope or chain haulage in a shallow slope is no longer recommended where the output is sufficiently large to justify the use of a belt conveyor. The arrangement at the Aluminum mine is ingenious and suggests another use of belt conveyors, namely, for solving peculiar problems of plant layout.

A mistake was made not long ago at a mine in Pennsylvania. Because a chain haul in a slope 250 ft. long and 60 ft. deep was inadequate to handle increased production during the war period, the management of the mine abandoned the use of the slope for haulage purposes after first sinking a shaft and erecting a new tipple. The bottom could have been altered to meet the requirements of a slope conveyor without seriously interfering with the daily operation of the mine.

In that event mine operation could have been suspended for a week or two while a temporary slope conveyor was being installed and a few alterations made on the tipple. The shaft and equipment today are as inefficient as the chain haul they displaced was inadequate. This mine is now producing nearly 3,000 tons of coal a day. Attempts to maintain a high rate of hoisting by quick acceleration and retardation in a short lift are shaking the headframe and the tipple and causing much spillage of coal during dumping.

No mining man need hesitate in accepting the possibilities of belt conveyors for transporting coal horizontally or on inclines because of doubts as to the life and dependability of composition belting. Reliability is a quality of well-designed belt conveyors. Only rarely is a duplicate unit installed as a precaution against breakdown. Standby units are not even provided in byproduct-coke plants which operate 24 hours per day, year after year. Belts with good splices seldom break without giving warning months in advance, whereas hoisting ropes sometimes snap in two without warning and apparently without an indication of weakness. Splices are not likely to break inopportunely unless a belt is greatly overloaded. At the Lynch plant the life of a splice is about two years.

Like the life of an automobile tire the life of a belt depends largely on the care taken of it. Its life will be greatest when it runs continuously with a capacity load. Weakness in a belt is not entirely the result of wear. In time it weakens from the effect of changing climatic conditions, moisture and strains caused by tension and bending. The greater the tonnage passed over a belt in a given period of time, the longer will be its life, figured in tons. Consequently the maximum productive life will be obtained at mines of large output.

From many sources come accounts of long life of belts under all kinds of conditions. If composition belting were not dependable and extremely serviceable, other industries would not use it as they do now in places where continuity of service is a requisite. In the coal industry such records of belt longevity are on file as should allay the doubts of the most skeptical.

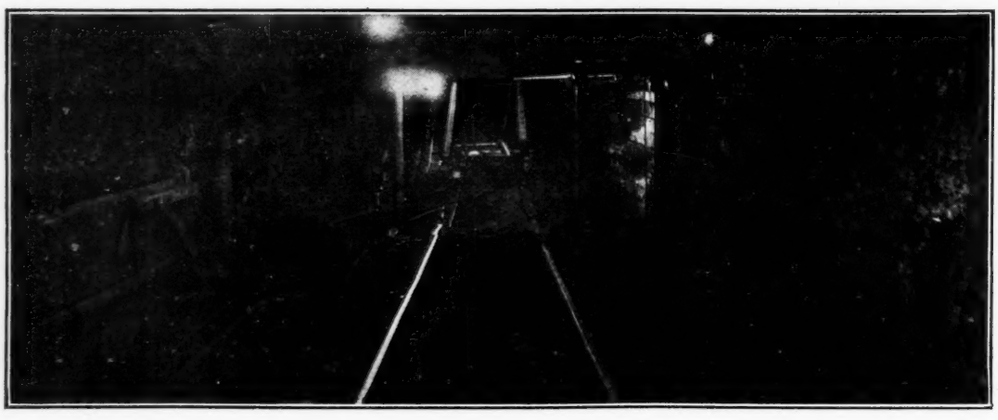
A 36-in. belt should have a life of not less than 2,000,000 tons of coal when properly installed and maintained. At the No. 9 mine of the United States Coal & Coke Co. at Gary, W. Va., a 36-in. belt on a 235-ft. conveyor, moving at a speed of 480 ft. per minute, carried 3,300,000 tons of run-of-mine coal in a period of eleven years. If intermittent operation and severe service curtail its life to one-half the figure given above, the life of a belt would still be considered long.

One 36-in. belt is credited with having carried 12,000,000 tons of pulverized coal, but that was a freak performance. In the Marvin colliery of the Hudson Coal Co. of Pennsylvania, two 36-in. belts in tandem units have been in service more than two years. During that time they have carried more than a million tons of anthracite under 4½ in. Yet they show no appreciable signs of wear. The well-preserved appearance of some of the belts in the tipple at Lynch, after carrying more than 2,000,000 tons of mine-run coal, is sufficient basis to forecast a life of twice that tonnage. Most of the sections of the main slate belt at this plant have been subjected to harsh abuse by over 500,000 tons of slate and continue to give service. Certainly the cases cited are sufficient proof that belt charges are low when figured on a per-ton basis.

The sizes of belts recommended for the transportation of the whole mine output vary from 30 to 48 in. Belts of these sizes, running within the maximum limit of speed, will furnish capacities up to 1,000 tons of coal per hour. If a still larger capacity is desired, a 54-in. belt can be used.

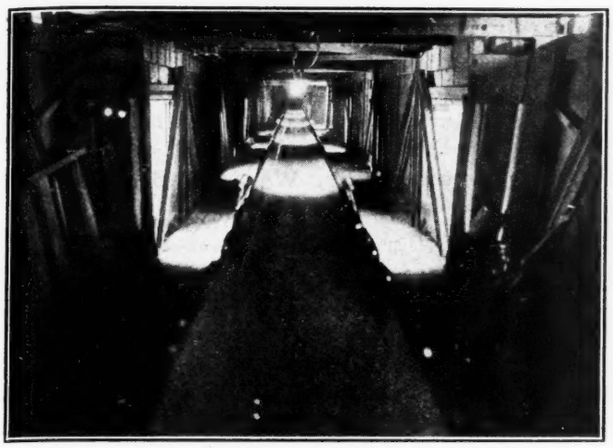
Most belt-conveyor experts recommend that for ordinary purposes conveyor units be no longer than 500 ft. and that the slope be no more than 18 deg. By increasing the belt speed or decreasing the feed, a belt conveyor may be lengthened to as much as 700 ft. on such a slope. It is a safer policy, whenever an inclined belt must be longer than 500 ft., to make it as near that length as possible even though horizontal belts may be used of much greater length.

Belt conveyors will carry coal on a slope of 20 deg. or slightly more but when they are being operated to



Dump at Kinloch Slope

In the Kinloch mine the mine cars are dumped into a bin, a pan feeder taking the coal to a belt conveyor. A spring latch and a kick-back switches the empty cars to the empty track. Cagers and cagers' helpers are eliminated.



CONVEYOR HANDLES 2,000 TONS PER SHIFT

Only five men and the conveyor are required to transport the output of the mine from the wagons to the screens on the tipple.

capacity the coal at the point where the conveyor is being emptied of its load may roll back, with unfortunate results. When the slope is thus steep one is never safe in the vicinity of the belt conveyor. Judgment suggests a limit of 18 deg. except for short distances, as at the overlap with tandem units.

The application of belt conveyors for hoisting in slopes, especially those of great length, presents several problems. The most important one perhaps is how to arrange the slope to accommodate a conveyor, manway and supply track. The Kinloch slope has only one wide compartment, in which the three travelways are located side by side. This practice is not advisable from the standpoint of safety.

The slope of the proposed Indian Creek operation of the Hudson Coal Co. of West Virginia is double-decked. At the spring line of the arched slope, which is about 14 ft. high and 11 ft. wide, a concrete floor reinforced with 6-in. steel beams will form the setting for the belt conveyor in the upper compartment. In the lower compartment will be placed the supply track, leaving ample room for a manway.

Escalators May Be Installed for Miners

In sinking a slope for a belt conveyor 1,000 ft. long or longer on an incline of 18 deg. the mine owner faces another problem: Will it be fair to expect a miner to climb a long stairway after a hard day's work? This objection might be met by installing one, or perhaps two escalators. The device is in successful use for transporting men to an elevated seam at a mine at Ward, W. Va.

Not all are agreed as to how the lower of two conveyors in tandem should be arranged to discharge coal onto the upper. I have in mind one proposed plan which specifies that the floor line of the lower half-length of the slope be above, but still parallel to, the floor line of the upper half-length. This arrangement would facilitate lapping the lower conveyor unit over the upper. The roof, of course, would have to be made higher above the junction, where also a hump would occur in the floor. This layout is not advisable as it would add to the difficulties of sinking and the offset would obstruct a free downcast of air.

A more logical layout is proposed in which a common floor line is provided for both conveyor units, with the roof made higher at the junction. To raise the head end of the lower conveyor unit sufficiently to give an overlapping at the junction point, the head end of the lower conveyor is sprung at an angle greater than the primary slope. Chute plates will most likely be used to ease the fall of coal at a junction.

Roller bearings on idlers are advantageous not so much because they reduce power consumption but rather because they greatly reduce attendance for lubrication. Plain bearings bind at times in spite of proper care. Grease cups on them must be filled every other day on an average; the more often they are turned during the course of a day the better.

Grease cups on roller bearings need be filled only once in two months and given a half turn each day. At Lynch they are filled once a month and given a whole turn each day to insure the injection of sufficient lubricant to the bearings. The Alemite system of pressure feeding, as used on automobiles, has been suggested. With it as many as twenty idlers are lubricated through pipe connections. The scheme is not believed to be practicable now but may be worked out later.

Conveyors for hoisting coal are disadvantageous in that a means for inspecting coal after it has left the mine car cannot well be arranged. Nowadays every effort is made to detect miners who load dirty coal and give it a good appearance by topping the car with clean coal. Market competition demands close surveillance of the contents of all mine cars. The possibility of providing an arrangement for facilitating the inspection of coal is a subject requiring consideration.

Slate Must Travel by Another Route

Contemplated slope-conveyor layouts call for the hauling of slate up the slope in mine cars by a rope. This provision seems crude when coupled with the highly efficient conveyor systems for hoisting coal. At least in large mines which take much slate to the surface, a belt conveyor could be superimposed upon or placed at the side of, one carrying coal. This might be used for taking slate to the tipple from which point it might be transported to the slate dump by another conveyor unit. Here is an opportunity to save much labor, and here again the arrangement at Lynch should serve as an inspiration. As already stated, secondary conveyors from the dumphouses discharge slate onto a main conveyor 686 ft. long and on an 18-deg. slope, ending at the slate dump on the mountainside. Some sections of these belts are expected to carry as much as 1,000,000 tons of slate before they are replaced.

By reason of its operating continuity a belt conveyor will maintain a steady, uniform stream of coal over the shaker screens, unlike the spasmodic discharge of two to ten tons of coal in mass. Consequently, the efficiency of the screens and of the attendants on the picking tables will be increased. Regularity of feed also will markedly lessen the vibration of the tipple.

By the adoption of the belt conveyor for hoisting coal, labor will be saved. Specialized attendance is not needed to control belt conveyors. The men who look after moving parts on the tipple can start and stop them at will by push-button controls. Thus the service of hoist operatives is dispensed with. Aside from lubricating, no other attention need be given to belt conveyors while they are in motion. Like the skip, they will eliminate the need for cagers and cagers' helpers and an attendant on the dumping platform of the headframe. Only as many men should be needed on the slope bottom as are necessary at the dumphouse of a drift mine.

How 1921 Agreement Has Worked Out In British Coal Mines

Miners Renew Demand for Revision —Seek Amendment Rather Than Destruction—Receive 83 per Cent of Profits, Want 87 per Cent

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

SINCE my return from the British Isles, renewed demands have been made for a revision of the British coal agreement of 1921. At this writing the matter still is under discussion, but despite wide dissatisfaction with some of the terms of the agreement, the predominant demand, as stated previously in this series, is for amendment rather than the destruction of the agreement.

The mine workers now are asking for an increase in the minimum wage. The minimum fixed by the agreement was 20 per cent above the basic wage of each grade of labor in July, 1914. The mine workers ask that this be increased to 40 per cent. They ask further that they be allowed 87 per cent of the standard profits instead of 83 per cent. There are additional demands dealing with the publication of further particulars of costs of production.

So that the existing controversy may be better understood, a condensed summary of the original profit-sharing agreement may be of interest. The agreement provides for the substitution of all the pre-war standards by a new standard wage, representing in each coal field a basic wage equal to the aggregate earnings of each grade of labor in July, 1914. A standard rate of profit is fixed for the capital used in the industry, and the surplus proceeds, after meeting the minimum wages and deducting other allowable costs of production, are divided in the fixed proportion of 83 per cent to labor and 17 per cent to capital.

The mine workers have contended from the start that they should participate in any profits derived from the industry as a whole. It was determined finally, however, that they should not share in the profits of the following related activities: Coke ovens and byproduct plants; smokeless fuel plants; manufacture of patent fuels; selling agencies and merchanting depots; operation of ships, barges and private railroad cars; privately owned railroads; farms and cottages; washeries and electric-power plants, except those at the mine.

OWNERS' DEFICITS NOT RECOVERABLE LATER

The standard wage is the first charge against the industry. In those cases where the proceeds have been sufficient to meet the standard wages, other costs and the standard profits, but insufficient to pay the mine workers the minimum wage, the operators have had to surrender the whole of their standard profits and are not allowed to carry forward against future income any such deficiency in their standard profits. This swallowing up of the operator's standard profit and any claim he may have for recoupment have resulted in determined protest. The operators contend that the agreement should be altered so that they may receive the same proportion of their pre-war profits as the miners receive of their pre-war wages and that temporary deficits should be recoverable when conditions improve.

Under costs of production admissable under the agreement come such items as timber, supplies, depreciation, royalties, surface damage and restoration, workmen's compensation payments and insurance, health and unemployment insurance, remuneration of mine foremen, rescue work, aid service, fire service, welfare fund. Among the operator's costs which have been held to be inadmissable are interest on capital and loans, contributions to trade associations, income tax and corporation profits tax, amortization of capital.

It is generally admitted that one of the great needs of the present agreement is to rearrange the districts. The mine operators originally contended for twenty-six districts. The mine workers wanted only one district. This resulted in a compromise that set up thirteen districts. It is believed that the mines can be gerrymandered into better groups. A joint committee of miners and operators now is engaged in a study of points in disagreement. The miners in South Wales, Lancashire, Durham and Scotland are particularly insistent on their demands for a larger share of standard profits. Frank Hodges, secretary of the Miners' Federation, has been a consistent supporter of the agreement, but he now is faced with the possibility of independent action on the part of the mine workers in the district mentioned above. Independent action would disrupt the federation and it is possible that a general vote will have been taken by the federation before this article appears in print. The coal agreement is terminable on three months' notice by either mine workers or operators.

WAGES ADVANCE 35 PER CENT

Mr. Hodges told George S. Rice, chief mining engineer of the U. S. Bureau of Mines, in September that the average increase in wages, as compared with 1914, had been only 35 per cent, whereas the increase in living costs was 70 per cent. On the other hand, he contended that the operators are getting a disproportionate amount of the profit. Since the 17 per cent is based on an average it results in many mines, Mr. Hodges said, making more money than ever before has been the case. He admitted, however, that many of the operators are in a bad way. He contended that the operators would be better off under a pooling arrangement covering the entire United Kingdom. He admitted that the banks will have to be particularly liberal in the case of some mines.

The high-cost mines must pay the standard wages even if they lose money. Mr. Hodges pointed out to Mr. Rice, however, that improved management in certain of these properties would make their situation less acute. In that connection it may be pointed out that deficiencies in management cannot be covered up, as was the

case under the old sliding scale, when there were periodic revisions of general wage rates according to fluctuations in prices and in volume of trade.

An idea of how the distribution of the proceeds works out may be had from the results of the joint audit of the South Wales field for May and June, which happened to be issued during the time that I was in the United Kingdom. That audit gave an advance of 3.85 per cent on the standard wage which was payable during September and October. The available surplus, which is divided 83 per cent to labor and 17 per cent to capital, was £1,606,118, or £215,639 more than in March and April. For Great Britain as a whole, during the time that I was in England, production was running slightly over 5,000,000 tons per week. The highest weekly output during the twelve which had preceded was that during the week ended April 21, when 5,824,900 tons had been produced.

Due to the basic importance of coal to British trade, both operators and mine workers are much interested in keeping the output at the highest possible point and are interested in winning all of the coal. Much study has been given the subject of eliminating the waste represented by unmined coal.

Next week Mr. Wooton will give further details of the working of the 1921 agreement.

Standardization of Underground Power Transmission

Factors Influencing Transmission Efficiency—Variation of Efficiency Due to Variable Loads With Low Load Factors

By Carl Lee
Peabody Coal Co., Chicago, Ill.

THE objects of standardization in mining have been nicely stated in the three words, safety, efficiency and conservation. The objects of standardization in underground power transmission might be correctly summed up in the words, safety, efficiency and economy.

The first of these, safety, is covered by a long list of rules developed principally from Bureau of Mines Technical Paper 138, "Suggested Safety Rules for Installing and Using Electrical Equipment in Bituminous Coal Mines," and rules of the National Electric Code.

The second object, efficiency, as applied to machinery is very well covered by the standardization rules of the American Institute of Electrical Engineers. Well-defined rules for testing, well-known laws of design, and keen competition in manufacture assure the mining industry of efficient electrical equipment.

Efficiency, as applied to underground power transmission may be simply defined as the ratio of the voltage at the load end of the line to the voltage at the generator end of the line. For any given steady load this may be measured by means of meters. For a simple two-wire circuit it may be quite closely calculated from tables or charts.

It is not physically possible to have 100 per cent efficiency in transmission. The usual 2 to 5 per cent loss in lighting circuits is almost impossible for mine circuits and even the 10 to 12 per cent loss sometimes found in industrial plants usually is unattainable for the average mine.

Paper presented at American Mining Congress Convention, Sept. 24-28, at Milwaukee, Wis.

In many states the maximum trolley voltage allowed by law is 275. Mine generators usually are designed for 250 volts at no load and 275 volts at full load, thus compounding 10 per cent. This compounding partly offsets the drop in voltage or loss on the line. The loss frequently, if not in the majority of cases, is over 20 per cent. Thus 275 volts less 20 per cent equals 220 volts at the load end. Manufacturers have realized the average conditions existing and therefore generally use 210- or 220-volt motors on coal-mining equipment.

The efficiency of transmission depends principally on the following: Voltage used, size of load, size of conductors, length of conductors, joints in negative and joints in positive.

For any given circuit an increase in the load decreases the efficiency of transmission almost inversely. For a given load and voltage an increase in the size of the conductors will increase the efficiency almost in direct proportion, while an increase in length will decrease it almost inversely. The joints in the conductors affect the efficiency in a similar way as the length affects it. The poorer the joints the lower the efficiency. This often plays an important part where the rails are used as the return circuit.

Ideal conditions where the load is steady and concentrated, the joints perfect, and the wires the same size on both sides of the line are seldom found. Such cases can be calculated, the proper efficiency decided upon and the exact wires required to give that efficiency installed. Unfortunately, these are rare cases in mining service.

The actual conditions usually met are complicated and require considerable calculation to arrive at even an approximate figure to represent the efficiency of transmission. Even with those figures at hand there is another factor to be considered. That is the economy of the entire mining operation. It is here that further study and standardization from an engineering standpoint will mean a great deal to the industry.

The efficiency of transmission required from an economic standpoint will depend upon or be affected by: (1) Cost of power at the main generating station or substation; (2) cost of copper and upkeep of lines; (3) load factor.

The efficiency of transmission should be increased as the cost of power increases. Thus the reduced losses would partly offset the increased cost per kilowatt-hour.

The cost of copper is reflected principally in an interest and depreciation charge, which is a considerable item, but not nearly so great as the cost of power.

The load factor affects the economy of transmission. If a line has a high load factor the percentage losses should be kept low; on a low-load factor the losses may be high for peak loads and low for light loads.

The load factor will be affected by the character of equipment used, thus: (1) Haulage locomotives usually have a low load factor; (2) gathering locomotives usually have a slightly higher load factor than haulage locomotives; (3) mining machines having shunt-wound motors and working at the face usually have a somewhat higher load factor than either of the above; (4) pump motors and fans generally furnish a higher load factor than any other form of load.

The various points mentioned are those that appear important in the consideration of additional standardization rules. A great deal of study will be required to formulate general rules to cover the subject of power transmission.

Storage: The Power to Make or Break Coal Market

Relation Between Consumers' Stocks and Price Almost Mathematical —Reserve Below 30,000,000 Tons a Sellers' Market—20,000,000 Tons the Panicky Point—Above 40,000,000 Tons Favors Buyer

By F. G. Tryon and W. F. McKenney

STORAGE is not an untried thing, an experiment to be urged upon a public entirely unfamiliar with the idea. With a great many coal consumers it is instead an established practice of years' standing. Like superpower, while we are talking about it, it has come. The pioneering in coal storage has largely been done, and the task of promoting now lies chiefly in inducing consumers who already store coal to store a little more, or inducing consumers who live from hand to mouth to adopt a practice that others in their own territory have long been following. The economic advantage of storage under some conditions became apparent long ago, and increasing economic pressure is rapidly extending the practice today. The problem of the engineer is therefore not merely to guard against spontaneous combustion, not merely to devise means to cut the cost of handling and reclaiming, but chiefly to show that it pays to store. If the economic incentive can be supplied, storage by consumers will come fast enough. The following is an abstract of a paper read at the annual meeting of the American Society of Mechanical Engineers.

TO APPRECIATE how far the practice of storing even bituminous coal has progressed, one need only consult the government's latest report on consumers' stocks of coal. On Sept. 1 commercial consumers and retail coal dealers had on hand an estimated total of 56,000,000 tons of soft coal, which is equivalent to five weeks' output at the present rate of production. This figure does not include 6,400,000 tons on the Upper Lake docks, 440,000 tons stored by the producers at the mines and at intermediate points, the millions of tons in transit in railroad cars and in vessels, and the large tonnage in the cellars of householders. This 56,000,000 tons is simply what commercial buyers of carload lots had on hand at points of consumption. The reports of these consumers furnish an adequate basis for estimate because the relation of their stocks in 1918 to the total stocks at that time found by actual count by the Fuel Administration is known.

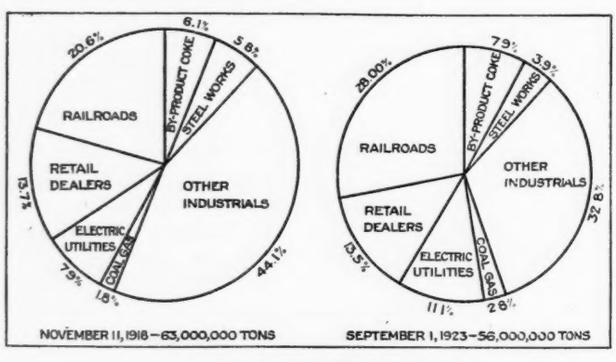


FIG. 1—WHO STORES THE COAL

The largest reserves of coal above ground are held by the general industrial consumers. The general industrials, other than coke ovens and steel works, had 44.1 per cent of the total in consumers' storage on Armistice Day (November 11, 1918), and 32.8 per cent on September 1, 1923. The next largest tonnage is that held by the railroads, which are followed in order by retail coal yards, electric utilities, by-product coke ovens, steel works and coal-gas plants.

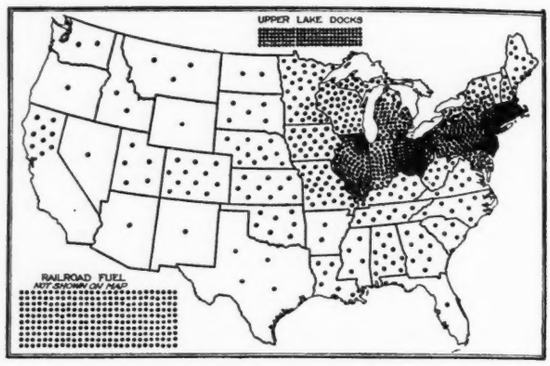


FIG. 2—WHERE COAL IS STORED

The geographical location of reserve stocks is influenced not merely by the number of consumers in a locality, and the amount they consume but by the fact that stocks increase as distance from the mines increases. The region of greatest density of storage is southern New England. In the three states of Massachusetts, Connecticut and Rhode Island there were approximately 6,000,000 tons in storage on Armistice Day. Other areas of dense storage are northern New Jersey, New York, Ohio, Pennsylvania, the Detroit district and the Chicago district.

The records of consumers' stocks include all coal on hand at the consumers' plants, whether in specially designed storage yards or in bunkers or bins, or simply in piles on the ground. How much of the large tonnage that accumulates under certain conditions is accommodated in specially constructed yards is not known. It is a mystery where the 60,000,000 odd tons that was accumulated by consumers in anticipation of the strike of 1922 was stored. Much of it was stored in emergency stockpiles, inconveniently placed and inadequately protected. We can take it as proved, however, that, given the incentive, the consumer can find means to store.

To equalize the seasonal demand for coal and relieve the winter burden of railway traffic would require the storage during the summer of only 20,000,000 tons more than is already stored. American consumers can manage to find room for this additional 20,000,000 tons. It could be put away without involving the construction of new yards, simply by utilizing more effectively the existing storage facilities or by expanding the crude arrangement of the ordinary small plant.

An interesting fact is that the smaller plants carry greater reserves, expressed in terms of days' supply, than the larger plants. This condition, shown graphically by Fig. 5, was in part the result of a deliberate policy of the Fuel Administration to give the smaller consumers priority in accumulating heavy stocks.

Stocks of the Provident and Improvident.—Up to this point we have been talking in terms of average stocks for the country, for some district, or for some class of consumers. In every community some consumers habitually live from hand to mouth and others habitually carry a reserve even larger than that which may be warranted by the condition of the market.

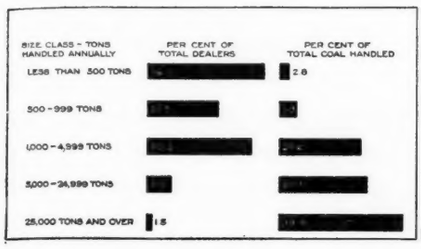


FIG. 3—THE SIZE OF RETAIL DEALERS IN SOFT COAL

Out of 21,207 coal dealers covered by a study of the Fuel Administration made in 1917, only 321 did a business in bituminous coal of 25,000 tons or more a year. Yet these 321 dealers handled 38.8 per cent of the total business. They probably carried nearly as large a share of the stocks in reserve.

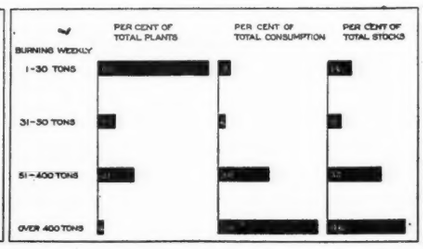


FIG. 4—SMALL INDUSTRIALS HAVE GOOD STOCKS

Small plants appear to carry a larger days' supply of coal in storage, but hold a relatively small proportion of the total tonnage in stock. From a study by the Fuel Administration of reports from 19,729 industrial plants (other than steel and by-product coke works) buying coal in carload lots; representing conditions in August, 1918.

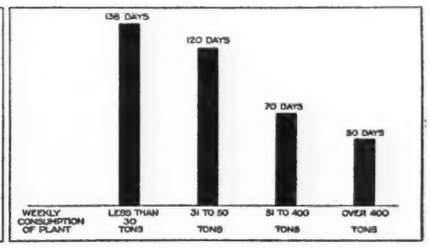


FIG. 5—DAYS' SUPPLY CARRIED BY LARGE AND SMALL INDUSTRIAL PLANTS, AUGUST, 1918

Bars represent days' stock of soft coal on hand in August, 1918, would last at current rate of consumption. From study made by the U. S. Fuel Administration covering 19,729 general industrial plants, not including byproduct coke and iron and steel works.

When the distribution of the reserve in storage is very unequal a shortage in supplies quickly brings distress and consequent sharp and excessive rise in price. We know now that the acute distress of consumers in the winter of 1917-18 was intensified by a very unequal distribution of stocks. A stoppage of rail deliveries due to severe winter weather and congestion of the railroads caught many consumers with no stocks at all. The price at that time was held down by government order, but all remember the heatless days and lightless nights that market that period. When prices are not under control it is the frantic bidding of buyers caught without supplies that has the most explosive effect upon the spot price.

Quite significant is the curve in Fig. 6 showing the stocks on June 1, 1920, when the "coal panic" of that year was approaching its height. Some champions of the coal trade have held that the shortage of that year was purely psychological, but the figures tell a different story. Seven per cent of the industrial plants reporting on June 1, 1920, had been reduced to less than two days' supply.

Changes in Price.—What is there to offset the cost of storage? Leaving out of consideration its effect in stabilizing prices, the advantages claimed for storage are: (1) Saving in price through purchasing when coal is cheap, and (2) insurance against shutdown of plant. Of these the insurance appears to make the stronger appeal. The remark is commonly heard, "There is no saving in price, but a man will pay anything to avoid shutting down." This remark is only half true, because most consumers know that even at times of shortage they can procure coal if they are willing to pay a price high enough to take it away from someone else.

The consumer has always the option of buying in open market. He is not justified in buying on contract except when he feels that in the long run he can do just as well as in the open market; and the test of the value of storage to him turns on whether or not its cost is kept within the range in the spot price.

Consumers' Stocks Control the Price.—The point to be emphasized is the powerful influence which stocks themselves have upon the price. The direct relation between spot price and the total tonnage of coal in storage is shown by Fig. 8. In this diagram the black columns represent the total quantity in the hands of commercial consumers on all dates of record from October, 1916, to September, 1923. The condition of stocks in between the black columns is not known exactly but may be inferred from the other facts of supply and consumption. Across the diagram moves a jagged line of spot price.

Output alone done not control price. Production made new records throughout the shortage of 1916 and 1917 and in the end nearly every consumer got his coal. A drop in production does not seriously affect prices until it is registered in lower stocks. As shown in the diagram, every time stocks have fallen below 30,000,000 tons the price has immediately increased and when it has dropped close to 20,000,000 tons the market has been in a state of panic.

So direct is the relation in the rest of the curve that we might almost plot the course of what prices would have been during the life of the Fuel Administration had they not been fixed by government order. Low stocks in the autumn of 1917 meant distress of consumers and would have meant runaway prices if the price had been free to respond. On the contrary, when stocks had been built up to a high level, late in 1918, there were districts in which the operators could not have obtained even the maximum price set by the Fuel Administration. Again the panic price of 1920 was related to extraordinarily low stocks, the consequence of the miners' strike of the preceding autumn, of severe

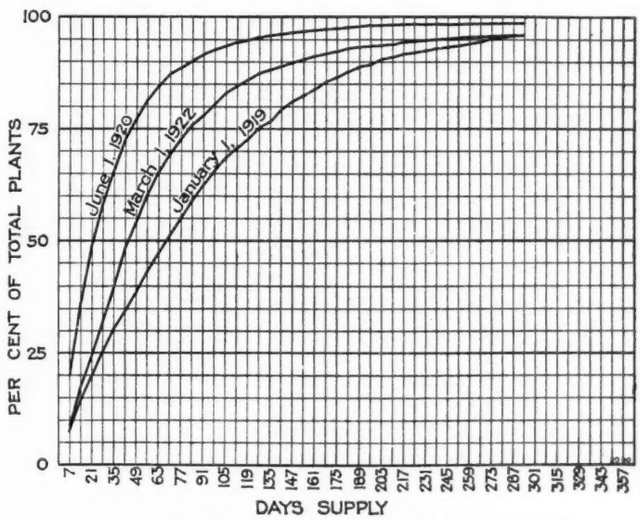


FIG. 6—INDUSTRIAL PLANTS GROUPED BY DAYS' SUPPLY OF SOFT COAL ON HAND

This shows the range in stocks at industrial plants on three dates, which typify the varying conditions of the last five years. The heaviest stocks were on Jan. 1, 1919. Some 40,000,000 tons had been placed in consumers' storage during the war year, 1918, and the condition more nearly represented general saturation than ever before, yet even then 60 plants were carrying less than two days' reserve and 122 were carrying two days' but less than seven days' reserve.

FIG. 7

Spot Price

Data for 1913 to 1923 cover fourteen coals that represent nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared, and run-of-mine normally shipped, and second with respect to the tonnage of each normally produced. This average is published currently in *Coal Age*. Data for 1912 and earlier years have been compiled by Mr. Tryon in as nearly the same way as the records permit, and though subject to revision are fairly comparable.

weather in February, and of the switchmen's strike, which handicapped the railroads from April to June, 1920. When, by the end of 1920, stocks had been adequately built up, the price quickly dropped to normal. Large reserves were maintained throughout 1921 and the price was correspondingly low. So dull was the market at this period that non-union operators cut wages and coal from union mines was sold at the barest margin if not at a positive loss.

Again, it was not until the heavy reserves built up in anticipation of the 1922 strike had been reduced below the level of safety that the price rose wildly. The same almost perfect inverse correlation is shown by the course of stocks and the course of prices since the settlement of the strike in September, 1922.

The lesson is not far to seek. Consumers collectively have the power to make or break a market. The relation between the consumers' reserve and the price is almost mathematical. A reserve below 30,000,000 tons indicates a sellers' market; 20,000,000 tons indicate a panicky market; and above 40,000,000 tons indicates a buyers' market in which salesmen again take the road and solicit business on the consumer's terms.

How Much Should Individual Consumers Store?—The record also includes a lesson for the individual consumer. If he is to profit to the full from the policy of storage, let him store more than his neighbors. He can then stay out of the market while his neighbor is in distress and is bidding up the price to scarcity levels.

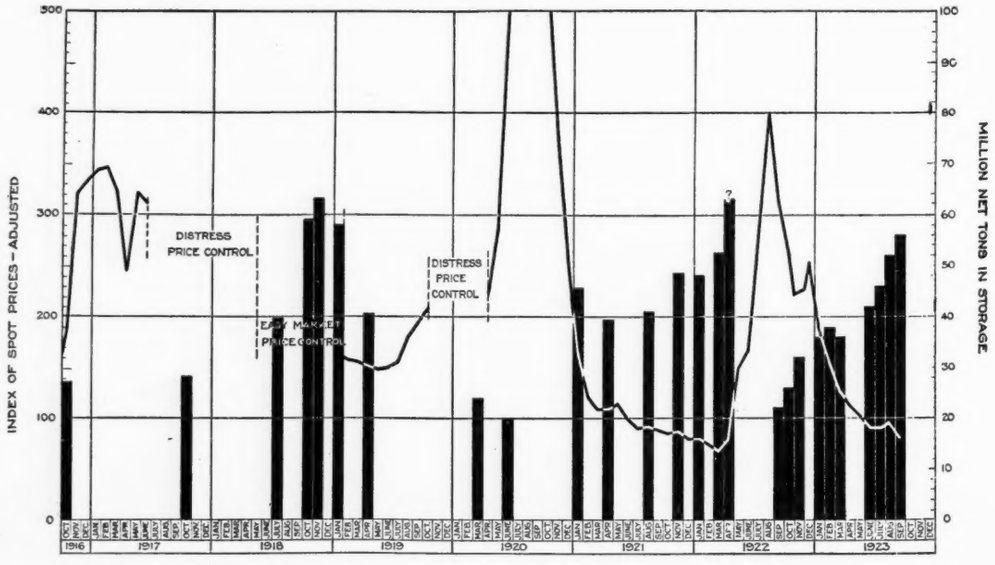
Many consumers live off their stockpile; clearly it is a mistaken policy. For two months after the strike of 1922 broke the price rose but little, and though the walk-out of men in the non-union fields showed to a keen observer the seriousness of the situation, the mass of consumers were so apathetic that mines in the non-union fields of West Virginia and Kentucky did not have orders enough to run full time.

The time to utilize the stockpile is not in the first stages of the suspension but in the last stages, or even for months after work has been resumed. Practically all these great suspensions have ended in the same way. They have ended in distress among consumers, rapid increase in price, pressure on the union operator to settle up and take care of his customers, and still more powerful, the operators' desire to participate in the highly profitable market that follows the strike. Why be one of the consumers whose distress forces a settlement? Would it not be better business, if the consumer is to store at all, to store enough to carry him past the peak of the price?

FIG. 8

Stocks and Prices

Black columns represent tons in hands of commercial consumers and retailers on all dates for which a canvass of stocks was made. Curve represents *Coal Age* index of spot prices f.o.b. mines, the average price July, 1913, to June, 1914, being taken as 100; adjusted, however, to eliminate increases due to the several increases in union wage rates. Thus adjusted the fluctuations in price reflect only the changing conditions of the market.



News of the Industry

Restriction of Trade Associations Seen As Foretaste of Coal Legislation

Action Against Cement and Tile Manufacturers Heartens Champions of Compulsory Statistics—New England and Northwest Coalesce for Anthracite Control

By Paul Wooton
Washington Correspondent of *Coal Age*

The successful way in which the Department of Justice is adding scalps to its belt in its campaign against trade associations has an important bearing on the legislative program as it pertains to coal. Judge Knox's action against the cement manufacturers, following as it does on the heels of the decree in the tile manufacturers' case, restricts further the chance of obtaining voluntary statistics from the coal industry. It is certain to give new heart to those who contend for compulsory statistics.

In this connection, the unexpected has happened in Pennsylvania, and apparently the anthracite-consuming states are ready to put all of their impetus behind federal regulation of the anthracite industry. It is regarded in Washington as being quite significant that the second Pinchot conference should have succeeded so well just at a time that it had been generally concluded that it constituted another fiasco. When a group of state executives representing different political parties and whose interests conflict sharply at many points are able to get together on a common program such as was outlined at the last Pinchot conference, it is evident that a new force looking to federal regulation has been unloosed.

The introduction by Representative Treadway of a bill dealing with the quality of anthracite and with its distribution was expected. While it was not known that Mr. Treadway contemplated the introduction of this bill, it was expected that someone from New England would sponsor legislation of that type.

In this attitude, however, New England has the warm support of the radicals, and even some of the conservatives, from the Northwest. Apparently the public in those sections is clamoring for some control over the anthracite industry. The bill, however, indicates a narrow and provincial spirit in that it does not include bituminous coal. It is very easy to observe that the author of the bill is looking at the problem from a local instead of a national point of view.

In conformity with the message of the President, the administration leaders apparently have no thought of favoring drastic action dealing with the coal situation. Judging from the developments of the past week, however, the initiative is to be seized by a New England-Northwest coalition. It happens that these members are in a position to obtain consideration for legislation even if they may lack the strength to carry it through to final passage.

Warns Smokeless Men Against Meddlesome Legislation

Addressing the annual meeting of the Smokeless Coal Operators' Association of West Virginia, in Washington, Dec. 13, Senator David A. Reed, of Pennsylvania, denounced governmental meddling with business.

Senator Reed criticized various proposals for the regulation of business, including legislation aimed at the coal industry. He warned the bituminous coal operators to keep close watch of legislation relating to the coal industry. He said that while the most discussion relates to regulation of the anthracite industry there are many members of Congress who do not realize that conditions in the bituminous and anthracite industries are different.

Roderick Stephens, chairman of the Government Relations Committee of the National Retail Coal Merchants Association, also spoke briefly, emphasizing the need of greater co-operation on the part of the entire coal industry.

About 100 members attended the meeting and unanimously indorsed the Mellon income-tax plan.

Robert H. Gross, of Boston, was re-elected president of the association. Mr. Gross was unable to be present because of a sudden illness. Oscar M. Deyerle of Bluefield, W. Va., presided in his absence while George Wolfe of Beckley, W. Va., acted as secretary.

Officers elected besides Mr. Gross were: William C. Atwater, of New York City, first vice-president; W. P. Tams, Jr., of Tams, W. Va., second vice-president, and George R. Collins of Charleston, W. Va., treasurer. Members elected on the board of governors were: Pocahontas district, T. F. Farreil of New York, and L. R. Page, Jr., of Philadelphia; Tug River district, John C. Steinbughler, of New York City, and George R. Collins, of West Virginia; New River district, G. H. Caperton, of Charleston, W. Va., and M. L. Garvey, of Winona, W. Va.; Winding Gulf district, W. P. Tams, Jr., of Tams, W. Va., and P. M. Synder, of Mounthope, Va.

Mr. Farrell, in presenting a report from the transportation committee predicted that the Interstate Commerce Commission would approve the proposed through rates on smokeless coal to New England and other Eastern points as submitted to the commission during the previous week.

Charge Unfair Trade Methods To Midwest Retailers

Unfair methods of competition in the sale and distribution of coal are charged in a complaint by the Federal Trade Commission against the Illinois & Wisconsin Retail Coal Dealers Association, including its officers and members. The association is composed of retail coal dealers of Illinois and Wisconsin. The complaint recites various methods by which the association and its members enforce its co-operative scheme of boycotting so-called "irregular" or "illegitimate" dealers, such dealers being determined by the association as being outside of its definition of a retail coal dealer.

The complaint further states that the association's acts constrain producers and wholesalers of coal to confine the distribution of coal in respondents' so-called "regular channels" and to prevent so-called "irregular dealers," co-operative associations and groups of purchasers from securing coal at wholesale or from any other source than from "regular" or "legitimate" retail coal dealers, thereby unduly obstructing and hindering free competition in the distribution and sale of coal in the association's territory.

J. B. Sanborn & Co., publisher of the "Coal Dealers' Blue Book," is listed as a respondent in the complaint, and is charged with co-operating with the coal association in its undertaking to confine the sale of coal in its territory to their so-called "regular" dealers. Others individually named in the complaint are Russell H. Jones, R. B. Herring, C. S. Dodge, I. L. Runyan, W. H. Baethke, W. J. Dambold, E. H. Keeler, A. H. Holcomb, R. S. Hunter, H. E. Eastman, J. H. Wall, F. A. Young, W. J. Baker, H. B. Gaines, R. C. Wagner, Jr., P. F. Irwin, W. S. Harwood, C. R. Burnton, J. V. Tapper and Joseph Rademacher.

Illinois Operator Suggests Government Control Plan with Teeth in It

H. C. Adams Would Have Coal Board Fix Prices and Restrict Output to One-Sixth Above Consumption, Aiming at 20-Day Working Months and Stability

An outline of a government-control plan to remedy the ills of coal has gone into the mails for Congressmen and others, from the office of H. C. Adams, president of the Peerless Coal Co., of Chicago, a veteran operator. It is called "Suggestions for the Solution of the Bituminous-Coal Problem" and was worked out after much thought and consultation with other experienced coal operators of the Middle and Far West.

Under this plan a permanent government commission of eleven with a minority of coal operator members would try to restrict production to about one-sixth in excess of the normal consumption of the country. This would be attempted (1) by licensing all producing mines, (2) by passing upon the necessity of opening any new mines, and (3) by requiring substantial and therefore expensive construction of all new mines and possibly by requiring them to operate from the first on a retreating basis.

The commission would gather and publish facts about coal and would "fix selling prices when production and consumption were close together," but would take no part in wage negotiations. Mr. Adams also firmly recommends the incorporation of the United Mine Workers of America. The complete set of "suggestions" follows:

"The Fact-Finding Commission developed, in their investigation, a number of conditions having to do with the general demoralized condition of the coal business. The report would indicate that one of the greatest, if not the greatest factor is over-development, which is by no means an unsolvable problem, and the writer, in offering the plan hereinafter described, is doing so in the belief that Congress has the power to change existing laws and to make new ones to suit conditions.

"Over-development of the industry cannot be regulated by the industry itself, and so long as unrestricted development is continued, the coal situation will be chaotic in every sense.

"The following plan is offered as a basis to govern future development and to secure the maximum of safety, economy and conservation.

"A commission to supervise the coal industry should be appointed by the President of the United States, and should consist of eleven members, as does the Interstate Commerce Commission, three or four of whom should be skilled coal mine operators, presumably one from the East, one from the central East, one from south of the Ohio River, and one from the Far West—the coal members should be in the minority. The other members should be selected business men. Their term of appointment should be not less than seven years.

"The commission should receive from railroads and coal companies statistics covering all matters pertaining to the development, production and marketing of coal and to cars in which to move it.

"*Method of Licensing New Mines.*—A company owning coal acreage desiring to open a mine should file application with the commission above described. With all statistical facts before the commission it would be easy to determine whether further development was justified and whether or not the applicant could develop new business or further divide the district's current business. When coal consumption reached five-sixths of the developed capacity of all mines, then further development should be authorized and such ratio maintained.

"It is obvious if five-sixths of the available supply of coal were consumed, the flow of coal must be on the basis of about twenty days of mine operation per month, and that the domestic user must take in a large part of his coal during the summer months, and that the steam consumer must store in the summer a surplus for winter. In other words, each month's supply of coal must be shipped in approximately twenty days, and if not consumed must be stored. The above distribution would obviate the necessity of increasing railroad equipment, as car supply is adequate if kept in service.

"This regular movement would permit the railroads to handle the business in a much more satisfactory manner to all concerned, and as coal and transportation are so closely allied, any plan that would help one must of necessity help the other.

"Wage-scale negotiations should be conducted as now, or if some better plan between the operators and miners could be devised it could be accepted, but the commission should take no part in such negotiations.

"Prior to the expiration of a wage contract the commission should make a public statement by districts and states of the rates of pay, days worked, days available and such other information as would be useful.

"In order to further stabilize the industry and make contracts between the operators and miners enforcible, labor unions should be incorporated.

"All new development of mines should be made on government or state plans, and full and careful consideration should be given to what is known as the retreating system of operating mines. This means the entries or haulageways are driven to the boundaries of the properties before room development commences. This plan contemplates the removal of practically all coal from the seam. It is a conservation measure and should be given consideration.

"It would be advisable to compel the purchase of the surface as well as the coal underlying it. This would permit of the retreating system and would eliminate the contentions arising out of subsidences.

"All mine buildings and shafts should be of fireproof construction, and particular attention should be paid to the shaft bottom. Sufficient supports should be left in to insure the mines' perpetual safety. Hoisting apparatus should be equipped to insure safety.

"Such restrictions would discourage all but competent, well-financed companies from engaging in the business, and would not only stabilize the industry but guarantee maximum safety to employees and conservation of coal measures, of which fully 35 or 40 per cent is now wantonly wasted.

"A glance at the financial condition of a great many railroads, utilities, packers, and others that are under government control or supervision discloses a reasonably satisfactory healthy business condition.

"It would be necessary for the commission to fix selling prices when production and consumption were close together, and they should be empowered to do so, allowing the producer a fair return on his investment. Prices could be easily arrived at by using average cost and quality, and requiring a standardized system of cost accounting.

"The commission should from time to time publish such facts concerning the working time of mines, earnings of the men, cost of coal, realization, and other facts which they may deem important for the public to know."

Hoodoo

An old woman with a bad eye aided and abetted by a Greek mystic in a greasy Chicago "lunch" nearly shut down No. 2 mine of the Union Pacific Coal Co. at Hanna, Wyo., on Dec. 13. A few days before the 13th the old woman with the bad eye had a dream—she saw No. 2 blow up on the 13th! Hanna heard all about it over the back fences and snickered—outwardly. Then came a Greek miner back from a Chicago visit. He had been in a restaurant in Chicago eating "whit cacks, cup coffee and pits oppla pie" and got a prophecy—so he said—from the mystic waiter that No. 2 mine was going to blow up on the 13th! Hanna heard it—and didn't even snicker. The morning of the fateful 13th, 20 loaders out of 110 went down. The evening of the fateful 13th the 20 came up. That's the whole story, except that Gene McAuliffe, president of the coal company, says the old women with the bad eye and the Chicago whit-cack mystic cost the company a thousand dollars.

"Governors'" Parley Directs Pinchot to Draft Hard-Coal Bill and Push It

Preus and Representatives of Governors of Four Other States Attend —Pennsylvanian Dodges Questions Before Newspapermen— Measure to Be Introduced in Congress in January

The second "conference of governors" called by Governor Pinchot of Pennsylvania to consider his suggestions for the regulation of the anthracite industry saw Governor Preus of Minnesota and four representatives of other governors, besides Mr. Pinchot, at Harrisburg on Dec. 13. They discussed the Pinchot outline of a federal bill and his proposed compact of states plan and authorized the Pennsylvania Governor to complete both and mail copies to the governors of the thirty anthracite-consuming states invited to the two conferences.

As matters now stand Governor Pinchot is approximately where he was when he first called the conference in November. At that time some of the governors asked to attend suggested that he mail to them any suggestions he might have. After the first conference he did mail skeleton drafts of his plans and now within a few days he will mail a complete bill, which he promised the conference he would have introduced in Congress, and a complete compact. On the other hand the Pennsylvania Governor lost no ground at the second meeting, for while neither of his suggestions was adopted it was unanimously agreed that something might be gained from a study of the completed idea and there was a decided sentiment among the half dozen conferees that federal legislation is needed.

Adopt Preus-Pearse Motions

Two motions were adopted by the conference. Governor J. A. O. Preus, of Minnesota, offered one which authorized Governor Pinchot to send the complete draft of the federal bill to all the governors of the anthracite-consuming states and that the Pennsylvania executive urge the governors to use their influence upon their Senators and Congressmen to support the measure. The other motion, made by F. M. P. Pearse, secretary to Governor Silzer, of New Jersey, provided that the compact be fully drafted and forwarded to the governors and that Governor Pinchot be empowered to call upon the governors for such assistance in its preparation as he may see fit.

In addition to Governors Pinchot and Preus and Secretary Pearse, there were in attendance at the conference Cyrus Locher, Director of Commerce, of Ohio; Dr. Frank J. Monaghan, Health Commissioner of New York City, representing Governor Smith of New York, and W. E. Snider, of Michigan.

It is not believed there will be further meetings. At least, nothing was said at the conference of Dec. 13 about reconvening the representatives. Governor Pinchot has said repeatedly that he will have the federal bill presented whether the other states go along with him or not, and while there is little to indicate that many of the states will co-operate with Pennsylvania in trying to adopt the compact, Governor Pinchot is said to have hopes that some of the states will accept this part of his plan. Those that indicate that they favor the compact can be got into line without a meeting, it is said at Harrisburg.

Only one suggestion was made at the second conference in reference to the Pinchot suggestions, and that came from Mr. Pearse, who said that wholesale coal dealers should be licensed under the state regulatory plan.

The same opposition that was manifested at the first conference to the compact developed at the second and it was led by the representatives of New Jersey and Minnesota. In fact these two did most of the talking with Governor Pinchot, the other three remaining quiet through the two-hour debate on the measures.

Invites Preus Behind Barn

Governor Preus asked whether, if the Pennsylvania Legislature were in session and a bill making the anthracite industry a public utility were introduced, the Legislature would pass it. Governor Pinchot replied to this: "In the presence of newspapermen, I must take the advise of counsel and refuse to answer. However, if you come out behind the barn I can tell you all about it." The Legislature of 1923 defeated a bill, sponsored by Representative Burns, of Philadelphia, which would have made the industry a public utility.

J. J. Walsh, secretary of the State Department of Mines, at the opening of the conference presented figures to show the findings of his inspectors who examined more than 1,000 carloads of anthracite at the mines. The reports showed that from 10 to 16 per cent of bone and slate was found in the coal. He defended the certification law of Pennsylvania and spoke in behalf of the proposed compact. The federal bill was discussed by Philip S. Wells, a deputy Attorney General, and Harold M. Evans, Philadelphia, who aided in drafting the measure. Neither of the Pinchot plans was taken up in detail and when the talk was leading nowhere Governor Pinchot brought it back to the matter before the conference.

"The principal thing, it seems to me," remarked Governor Preus finally, "is to get the federal legislation before Congress as soon as possible."

Governor Pinchot agreed with him and said it should be introduced early in January. The two motions were then offered and quickly adopted.

Lawmaker's Impression of Hard-Coal Legislation

"You will hear the anthracite industry discussed in Congress this winter out of an immensity of ignorance, and I advise you to watch closely what is done, because the fact is the majority of men who will vote upon that question do not know that there is any difference between the conditions under which anthracite is produced and the conditions under which bituminous coal is produced."—Senator Reed, of Pennsylvania, before the Smokeless Coal Operators of West Virginia, in Washington, Dec. 13.

O'Gara Coal Co. Wins Suit

A verdict for $82,801 was recently rendered against the Chicago, Milwaukee & St. Paul R.R. by a jury in the District Court of Douglas County, Neb., in an action brought by the O'Gara Coal Co. for alleged violation of contract.

The contract, entered into Sept. 2, 1920, covered the entire output of the O'Gara Coal Co.'s No. 11 mine, the output not to exceed 1,500 tons daily nor to fall below 1,350 tons, at an agreed price of $4 per ton, the damages sought being based upon alleged losses incurred by the coal company because of the failure of the railroad to accept full tonnage covered by the contract during its life of seven months.

Judge Troup, who presided, in his instructions to the jury held that the railroad company, inasmuch as it used a larger tonnage of coal daily than that specified in the contract, could not rely upon 'unusual conditions' as a defense.

The coal company sued for $165.602.

Silzer and Ritchie Repudiate Pinchot Plan

Governor Silzer, of New Jersey, and Governor Ritchie, of Maryland refuse to have anything further to do with Governor Pinchot's plan for concerted action by anthracite-consuming states to bring down prices. In an address before the Board of Trade and Transportation at New York City, Dec. 12, the New Jersey Governor characterized the Pinchot proposal as impractical and again put the main job of housecleaning the industry up to the State of Pennsylvania itself.

Governor Ritchie of Maryland sent a letter Dec. 12 to Governor Pinchot declining to set up "coal-distribution machinery" in Maryland, in accordance with the plan of the Pennsylvania Governor. The Maryland executive held that creation of a state regulatory commission, with consequent expense and additional officeholders, was not warranted by conditions in his state. The Pinchot plan, so far as it provides for regulation by the State of Pennsylvania, is a matter that can be left safely with the Pennsylvania Governor, Governor Ritchie wrote.

Second National Power Exhibition Proves Bigger Success Than the First

Interest in the annual show of power and mechanical apparatus held at the Grand Central Palace, New York, Dec. 3-8, was even greater than that of last year, when the first national power show was held. Exhibits covering nearly every phase of power generation, power-plant control, and fuel analysis were displayed before the engineers and interested public. The success of this year's show was helped much by the joint meetings of the several engineering societies in New York during the same week.

Naturally most of the exhibits dealt with the production of power from coal and fuel oils. There was, however, a lack of power-generating machines, such as reciprocating engines and turbines. Many of the exhibits showed full-size power plant equipment, which in many cases was supplemented by educational talks and graphic and pictorial illustrations, together with an extensive program of motion pictures.

Starting with a display of the various kinds of wood, coal and oil fuels, it was possible for one to go through the exhibition hall and follow the processes of conveying, preparing and burning the fuel to the smokestack and the ashpit. The exhibits covered every phase of power-plant equipment from furnaces, boilers, burners, control, metering and conveying apparatus to flue-gas analysis. To those following the rapid development of the power plant, new types of stokers for burning small sizes and pulverized fuel were most interesting. One could not help but see that the development of this equipment is pointing the way to the day when fuels once considered waste products and unburnable will be utilized at efficiencies as high as, if not higher than, the best grades of coal are being burned today.

Change in Boiler Design

In keeping with the advancement made in stokers, there has been a change in boiler construction leading to the use of higher steam pressures, and to withstand these high pressures and high temperatures the most modern power plants are now changing and remodeling much of their equipment. To meet these conditions the valve and fitting manufacturers have designed their products for pressures up to 400 lb. and steam pressures as high as 800 deg. F.

Another interesting part of the show was the complete line of steam and power-house specialties. Many of these accessories have been designed to eliminate the human element, making almost everything about the power plant automatic. In this way plant operation may be carried on at the highest point of efficiency. Many of these appliances may be interconnected and co-ordinated with the rest of the system so as to regulate the furnaces, boilers, dampers, fans, etc., to obtain the best operating conditions automatically with changes in the load.

A novel device applied to coal and material conveyors on exhibit was the Merrick conveyor weightometer, manufactured by the Merrick Scale Manufacturing Co., of Passaic, N. J. This machine will weigh and record the weight of any material while in transit over a belt, bucket, or pan conveyor, without interrupting the flow.

Another exhibit of interest to the man who must convey coal was the Sandvik steel belt conveyor, made by the Sandvik Steel Co., New York, which was equipped with scrapers for unloading any portion of the material at any required location along the line.

The exhibit of the Fuller-Lehigh Co., of Fullerton, Pa., showed complete details of a coal-pulverizing plant, with pulverizers and blowers for various types of furnaces and boilers.

The Pyramid grate, manufactured by the Pyramid Iron Products Corporation, of New York, showed a novel design of grate, permitting a 30 per cent air space without the loss of even the ordinary small size fuel through the grate.

For emergency and auxiliary power supply the mining man found much interest in the fuel-oil engines of the Climax Engineering Co., of Clinton, Iowa. Several drives of this type are already installed in some of the coal mines for emergency power supply in case of fire or accident.

To the tipple, breaker and washery man, the Smith type friction clutch, made by the Hill Clutch Co., offers a solution to the driving of coal-preparing machinery from a main-drive shaft, or where machinery must be started slowly or inched.

For the mine shop, office, club and recreation hall, the Fellinger & Hebard Co., of New York, had an interesting exhibit of the Bradley washfountain, an easily installed fixture, which better meets the requirements of sanitation, economy and satisfaction than the usual washstand.

Coal Consumption and Power Output of Utilities Higher

Electric public-utility plants consumed 3,546,831 net tons of coal during October, according to a report just issued by the U. S. Geological Survey. This compares with 3,172,534 tons consumed during September, according to corrected returns.

Fuel oil consumed by public-utility plants in October totaled 1,426,620 barrels, compared with 1,335,356 barrels in September. The average daily production of electricity by public-utility power plants during October was 160,400,000 kw.-hr., compared with 151,200,000 kw.-hr. in September.

19-Year Mine Has No Strike, Fatality or Shutdown

Production of over 2,500,000 tons of coal without a fatality, a strike or shutdown and nineteen years under the same active management is the record of the Gay Coal & Coke Co., of Logan, W. Va., according to R. M. Lambie, chief of the West Virginia Department of Mines. The company opened the first mine in the Guyan Valley and made its first shipment of coal on Thanksgiving Day in 1904. Tom Gilpin, one of the three teamsters that helped to load the first railroad car at the mine, is still with the company.

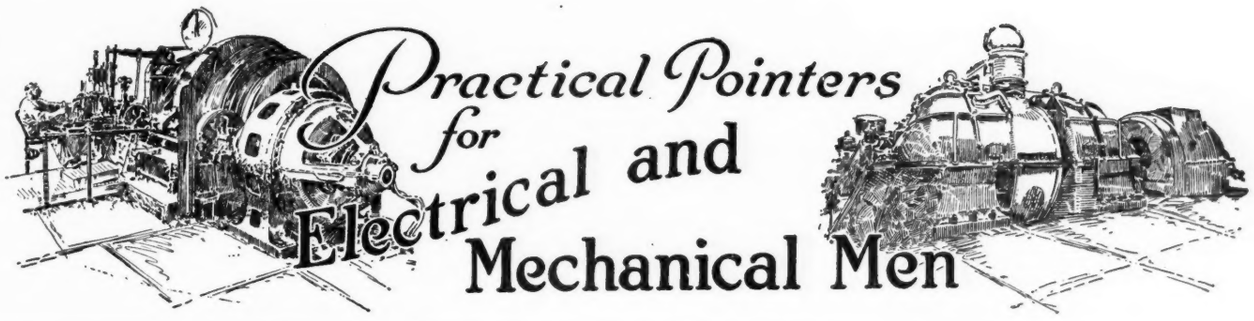
H. S. Gay, Jr., superintendent, attributes the achievement of this record to (1) Strict compliance with the mining law and company rules; (2) unusually good roof conditions; (3) when bad roof has been encountered, all timbering has been done by company men under the supervision of an official; (4) employees have been mostly native West Virginians, who seem to acquire proficiency in mining easily; (5) full co-operation by the men; (6) all operatives of electric locomotives and mining machines served their apprenticeship in the mine; (7) efficient signal system that gives the exact location of all electric locomotives at all times; (8) all transportation is handled as on a modern railroad; (9) proper methods of handling, transporting and using explosives.

Among the many employees of this company during its nineteen years of operation have been Jack Dempsey, world's champion heavyweight boxer, and Don Chafin, Sheriff of Logan County, West Virginia. Both were employed as miners.

To Discuss Mining Industry

Forecasting of business booms and slumps will be the topic discussed at the annual meeting of the American Statistical Association, to be held Friday, Dec. 28 at the New Willard Hotel, Washington.

The program of the mining session, which begins at 2 p.m., Dec. 28, presided over by John Hays Hammond, is as follows: "Fluctuations in Mineral Output," George Otis Smith and others, U. S. Geological Survey; "The Effect of New Technique on the Past and Future Production of Petroleum," Joseph E. Pogue, consulting engineer, New York City; "The Metals," E. H. Robie and F. E. Wormser, assistant editors, *Engineering and Mining Journal-Press;* "The Bituminous Coal Industry in Prosperity and Depression," D. L. Wing, consulting statistician, Washington, D. C., and F. G. Tryon, U. S. Geological Survey. Discussion will follow.



Test for Adhesiveness Of Friction Tape

A much-used specification for determining the adhesive strength of a tape is: "The adhesion between adjacent layers of the tape shall be such that when a strip of tape 2 ft. long is taken from a roll and wound upon a mandrel 1 in. in diameter, under a tension of 10 lb. per inch of width at a rate of 30 in. per minute and allowed to stand for three minutes with the weight attached, a weight of 4 lb. per inch of width shall not cause the plies to separate at a rate greater than 30 in. per minute. The test shall be made at a room temperature not less than 21.1 deg C. or 70 deg. F. nor more than 23.9 deg. C. or 75 deg. F., the sample having been kept within these limits for at least 30 minutes immediately preceding the time of testing.

"The mandrel shall be so free in its bearings that a weight of 1 oz. will cause it to revolve freely when suspended from a cotton string wound in a single layer on the center of the mandrel."

The conditions of such a specification must be carried out scientifically and exactly in order to obtain reliable data on adhesiveness. A variation of any one of the conditions will entirely alter the results. This essential property of a high-grade tape—adhesiveness—cannot be determined by any casual or superficial means, such as sense of touch, etc.

How an Easy Repair Was Made To a Synchronous Motor

A synchronous motor driving a large air compressor recently gave us trouble. This motor is first of all started as an induction motor and after being brought up to speed it is changed over to a synchronous motor. For some time this motor was becoming more difficult to start, until finally it was impossible to bring it up to the correct speed before changing over to a synchronous motor. The difficulty was that the squirrel-cage starting winding had become loose between the poles, being built into the field poles.

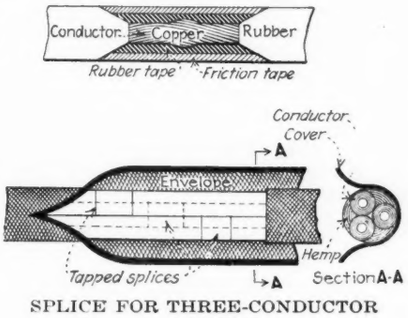
To make a quick repair some soft solder wire was hammered into thin sheets and inserted between the bolted sections of the squirrel-cage winding. When the bolts were tightened the sheets of solder worked into the rough surfaces at the contacts and formed a good conducting path from one section of the winding to the other. In this way the resistance of the starting winding was lowered so that it was easy to bring the motor up to full speed before changing over to a synchronous motor.

SHOP FOREMAN.

Splicing 3-Conductor Cable

The good workman is always endeavoring to make his last piece of work better than the previous one, but he is always ready to try out a new method if it looks practical and will accomplish something in a little better way than it was ever done before. Therefore I wish to submit to *Coal Age* readers the following method for splicing a three-conductor cable:

First of all the sheathing is split open in a line running with the cable. This sheathing is opened up and carefully handled so as not to be torn or broken. The three conductors are then exposed and the hemp or jute filler removed. Each conductor is next cut so as to be joined as shown in the illustration. By arranging the splices in the individual conductors as shown, a neat splice can be made in the cable.



SPLICE FOR THREE-CONDUCTOR CABLE

Each conductor is carefully spliced and taped before the outer envelope is closed around to complete the splice.

In splicing the individual conductors much care should be taken because the joint should be electrically perfect and mechanically strong and at the same time should not be bulky. The upper part of the illustration shows how the rubber insulation has been tapered off and also how the taping is applied. Note that the outside diameter of the conductor at the joint is no larger than the main section of the same wire.

The illustration also shows how the wires are finally brought together and how the outer sheathing may be closed in to complete the splice. Usually the cable will be saturated with wax or some kind of compound to prevent moisture from entering.

W. VIRGINIA.

Trouble That Was Not Trouble

On the afternoon of one of the numerous holidays our company has had recently one of our electrical men went to the power-converting substation at the mine where he was employed and tried to start one of the two rotary converters there and found something that puzzled him and some of his superiors for some time.

These two rotaries were driven by alternating current fed to them by two separate banks of step-down transformers. To start either machine it is first of all necessary to close a switch that puts power on its bank of transformers. Our electrician closed this oil switch in the usual manner but noticed that the ammeter on this circuit gave a sudden indication of very high current just as the switch was closed. In fact, this current was about twice full-load current for the transformers. Without going any further with the operations necessary for starting the rotary connected to these transformers he tried the same thing again, with the same results—a high initial inrush current. Next he tried the oil switch for the other rotary converter, but it showed only a small initial inrush current.

From these observations it appeared as if there was trouble with the first bank of transformers. It was easy to come to this conclusion because the transformers were located outside and had been transferred to the mine after lying idle in another section of the region for over a year.

It was finally decided that there was a breakdown in the first bank of transformers and this break flashed to ground only when the transformers were thrown on the line; the flash, occuring in the oil, was quickly smothered almost as soon as established. Preliminary investigation of the transformers exposed no sign of a breakdown so a "Megger" was obtained and all the transformers tested. The tests showed

that the particular bank of transformers supposed to be in trouble showed a higher resistance test than the other.

This beclouded the matter still further and by night time nothing new was found. The next morning the chase after the trouble was resumed and by starting from the beginning of the supposed trouble it was found that the high initial inrush current happened depending upon the instantaneous value of the voltage of the line wire that the meter was in when the oil switch was closed. Both banks of transformers showed high and low initial inrush currents depending upon the instantaneous voltage of the line and the quickness with which the switch was closed.

ELECTRICAL ENGINEER.

Starting a Synchronous Motor-Generator Set

We recently experienced some trouble in starting one of our motor-generator sets and after careful examination found that all the electrical circuits and everything in connection with the operation of the machine was correct, yet it was not possible to bring the machine up to speed before throwing over on the full line voltage.

This motor-generator set consisted of a synchronous motor and a 250-volt direct-current generator. When the motor was thrown on the starting voltage it would start without much hesitation but it would not come up to speed sufficient to throw over on the running voltage without an abnormal initial-current inrush.

It so happened that this synchronous motor was excited from the direct-current generator which it drove and as the generator is started it feeds current into the synchronous field of the motor. The result of this action was that the exciting current built up a field in the motor which exerted a dragging effect upon the revolving element. By putting all the field resistance into the field circuit of the motor we were able to bring the machine up to speed on the starting voltage. After this it was possible to put the machine on full running voltage without any difficulty.

SUBSTATION.

Effects Produced by Electric Current

When electric current flows in a given conductor it may be used to produce one of several effects. Principally these are, chemical, heating and magnetic.

The first—chemical effect, also known as electrolysis—takes place when a current is made to pass through a liquid containing a metal in solution, or where a liquid and metal come in contact with each other. In the usual method of applying electrolysis the current causes metal to be deposited on a metallic object suspended in solution. This is known as electroplating.

The second effect—heating—is the transformation of electrical energy into heat energy, which takes place when current flows through a conductor. Generally the conductor used for making heating appliances is made up of wire or grids having a relatively high resistance. A soldering iron is a typical example. A more common use of the heating effect of electrical current is that of the incandescent light. In the electrical circuit of the lamp the current passes through a filament of high resistance and this filament becomes heated to incandescence, thus giving off light. Electric welding is another application of the heating effect of electric current.

The third and perhaps most important effect produced by electric current is magnetic. A conductor carrying electric current has around it what is known as a magnetic field. To strengthen this field it is common practice to wind the conductor in the shape of a coil and place inside the coil an iron core. This iron core tends to intensify the effect of the magnetic field. The electric motor is an important illustration of the application of the magnetic effect of electricity. It is the attraction and repulsion of the magnetic field in the armature and the field poles of electric motors which makes possible the operation of the motor.

Finding the Cause of Armature Burn-outs

It is sometimes difficult to locate troubles with electrical equipment and sometimes hard to remedy them but here is one that was remedied very easily—by eliminating the cause.

One of our locomotives was always giving us armature trouble. I can remember many a day when the electrical workmen labored hard during the day to change armatures in this locomotive and then again late at night to repair the armature.

After considerable and careful inspection of all the equipment on this locomotive the trouble still persisted. Some time later another locomotive was put into this section of the mine and the troublesome one was transferred. Soon the new locomotive began to develop trouble and the old locomotive operated in another section with little or no trouble.

At first we were at a loss as to what was causing the trouble, but one day near the noon hour I was passing through the section in which we were having all this trouble and I went over to see how things were going. When I got near the locomotive everything appeared to be as normal, but I waited around a little while and soon noticed smoke coming from the resistance. I immediately started to investigate the trouble, and much to my surprise I saw a piece of burned bread on the resistance. The motorman had locked the wheels of the locomotive with the brake and had turned on the power to heat the resistance to toast his bread. This was the cause of our burned commutator segments, burned-off armature coils and high cost of repairs. The cause was removed; the motorman is working for another company now.

MINE ELECTRICIAN.

Keep the Power-Demand Charge Down

To obtain the advantage of a high load factor, or, in other words, to keep our maximum demand as low as possible, at one of our mines where we are purchasing power we have tried to do whatever work we could at off-peak times.

Quite naturally we laid out one of our largest pumping stations so that pumping could be done at night. In order to do this we made a large sump area and could hold water in this sump until night time during the usual mining high water season. Somehow or other the men at the mines could not get the idea of pumping at off-peak times and the result was that the pumps were started and run when we had our other peak loads.

After considerable time and education on the subject at the mines, we thought we had everything understood, but occasionally someone would start the pumps to test them or inspect them at the wrong time.

Our work seemed hopeless, for the pump demand always seemed to be on our monthly power bills. One day a happy thought occurred to us and we put a time switch on the control. This time switch is set to cut off power to the pumps except during the night time. Now our troubles are over and the saving on the power bill is about $200 a month.

ENGINEER.

Heating of Conductors In Mines

Can you tell me where I can get some information regarding the heating of rubber-covered single conductors, double braided, carrying 3-phase A.C. when in iron or steel conduit? The problem is fully covered for lead cables, but I have been unable to find anything on three individual conductors.

The problem seems to be impossible of purely mathematical solution, due to the fact that some of the heat is undoubtedly carried from the wire to the surrounding iron by convection. Figures neglecting the convection currents and considering the body of air inside the pipe as dead, give results entirely too high to be of any value.

As an example, with three wires carrying 440-volt 3-phase 60-cycle current of 200 amperes in 2-in. conduit in the mines where the ambient temperature is fairly constant at 55 deg. F., A 1/0 wire is sufficiently large for voltage drop, but will it be sufficiently cool at the above temperature to protect the rubber insulation?

B. K. SHANER,
Assistant Electrical Engineer.
Trackville, Pa.

Problems In Underground Management

Timbering Methods That Will Save Lives, Coal and Lumber

Timber Should Be Recovered—Mistake to Forbid Use of Axe in Removing Props—Protect Men in Pitching Bed by Use of Battery of Lagging

By James Gray
Newcastle, Washington

In drawing pillars, or in longwall retreating, all timber that can be safely recovered should be withdrawn as the work proceeds. If in removing pillars the gob or waste is filled with props and cogs, the weight of the roof is thrown down on the coal face, so that the roof tends to break over the top of the pillar, thereby making the roof dangerous to work under. This also breaks the coal, increasing the percentage of slack.

All timber should be drawn to within 12 or 15 ft. of the coal face in order to allow the roof to cave in. Such roof falls make the mining of coal much easier and provide conditions favorable to the production of a larger percentage of lump. Cogs also should be drawn if possible, or, better yet, they should not be erected unless absolutely necessary, and then only as skeleton or empty cogs. When they are not filled they can the more easily be taken out. The idea is to allow the roof to cave in behind, thereby taking the pressure off the coal face. I have had charge of mines in Scotland, Nova Scotia, Canada and Australia where every prop was pulled out of the waste which could be safely removed, and much of this work was done on contract.

Chopping Out Cap-Pieces

All props were set with a good cap-piece on top so that when the prop had to be drawn this cap-piece could be chopped off with a good sharp axe. Sometimes a wedge, made for the purpose, was used for splitting the cap, if the roof was not too heavy. If the roof was weighty, we dug around the bottom of the prop or split off as much of the cap-piece as we could with safety; then a prop puller was used to pull out the timber. Only experienced men were employed for recovering props and cogs.

The method we adopted was as follows: After the first lift of coal was taken off the pillar, we set our first row of props—good stout timbers with cap-pieces 4 in. thick by 9 in. wide by 18 in. long. We kept putting in rows of props every 4 ft. apart until we had four rows in line. Whenever there was room for the fifth row we pulled the first row of props and moved them behind the last row. We kept on doing this, always keeping four rows of props behind the miners, until the roof took its first break and came down. This took the weight off the face.

After the first break we used only two rows of props, always advancing the back row as soon as room was made for them. We did not set the props so tight that we would have trouble in pulling them. If one chanced to stick, we generally got it out by the use of the prop puller, and seldom did we have to shoot it out. When we had occasion to put in a cog we built it up like a cage, entirely without rock. The foregoing work was done in seams that were nearly flat.

On a seam pitching 25 deg. or more, more care would have to be taken. This could be done by placing behind the miners a battery which need be only 3-in. x 12-in. x 9-ft. timber laid against the second row of props to keep any material from falling down on the miners at work. I feel confident that all or nearly all, the timber could be taken out of a pitching seam as well as a flat seam, and for this reason: The props need not be set at right angles to the full pitch. Set a little away from the perpendicular to the seam it would not be hard to dig around the bottom on the front side of the prop and pull it out by the use of the prop puller.

Why the Difference in Laws?

This reasoning is true both for anthracite and bituminous mines. Rule 55 in the anthracite mine law, which prescribes that props shall be blasted and not cut out, should be changed to agree with the terms of the bituminous mine law. I fail to see sufficient difference in conditions to justify the variation in the enactments.

The mining laws should be amended so as to make it compulsory to pull out all timbers in coal mines where it can be done with safety, but the law should be so worded that operators would be allowed to employ only practical and experienced men to do this kind of work. Much timber and cost would certainly be saved thereby. In pulling pillars on a pitching bed, I would add one row of props to the two rows I have recommended for use with a flat bed, especially if the lift of coal is to be taken up on the angle as a wing, instead of across the top of the pillar.

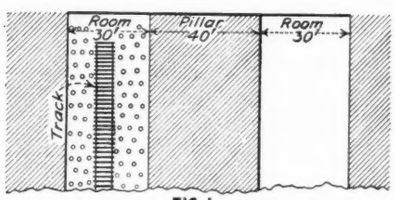


FIG. 1

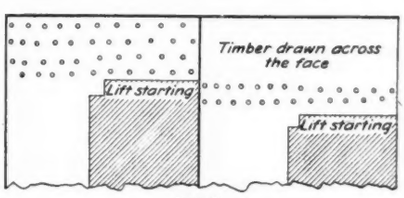


FIG. 2

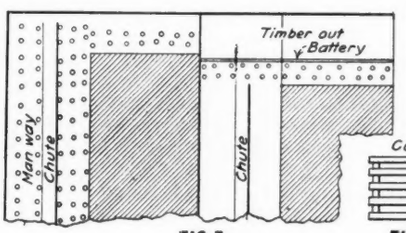


FIG. 3

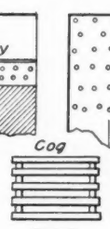


FIG. 5

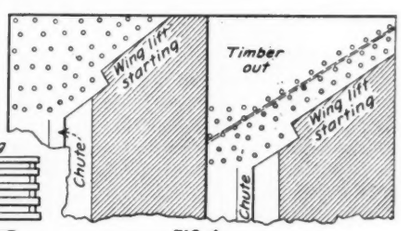


FIG. 4

FIGS. 1 TO 5—HOW TO TIMBER ROOF SYSTEMATICALLY

Fig. 1 shows room and pillar. Pillar of working on left of Fig. 2 is just commencing to be drawn. Four lines of props are left, the fifth line being set by props progressively withdrawn from the first line. In the room on the right is shown the method adopted after the first break. Here only two rows of props are used. On the right of Fig. 3 a timber battery protects the miners. Fig. 4 shows the rib being mined on a slope and Fig. 5 a skeleton or unfilled cog.

McAuliffe Increases Safety in U. P. Mines; Installs Loaders

A number of mechanical and management changes now in process of development in and around the Wyoming mines of the Union Pacific Coal Co. are expected to increase safety as well as the output of the properties. The installation of mechanical loaders, which has already drawn criticism from inspired sources, is one of the improvements. Eugene McAuliffe, president of the company, recently explained what is going on in the mines thus:

"A double reinforcement of past safety effort in this company is about to be put into effect. On Oct. 1, A. W. Dickinson, an engineer experienced in the operation of coal mines and the conduct of safety work, was appointed safety engineer, in charge of accident-prevention work. Mr. Dickinson has adopted a new slogan, 'Make It Safe,' as keyword of the safety department.

"The Union Pacific Coal Co. has for years maintained first-aid and rescue crews, keeping up the work of training men, providing new and modern apparatus, etc. At the present time many items that tend to make mine work safer are either complete or are under way, included among which might be mentioned the preparation and posting at mines of ventilation maps which show the direction of all air currents, a definite reading of the volume of air passing through the last crosscut on each entry made and recorded daily, special men being assigned to this work.

GAGES RECORD AIR PRESSURE

"Recording gages actuated by clockwork have been ordered for every mine fan. They will provide the mine foremen with a positive record of ventilation during each 24-hour period, and this record will be inspected by the foreman before the men enter the mine each morning, and the fan chart for the day will be filed for record. Where coal dust is a hazard, the roadways and rooms will be sprinkled twice as frequently as heretofore and rock-dust barriers are being installed to localize any accident that might occur.

"In addition, dry mines are being equipped with sprays to moisten the air entering the mines, and the use of black powder is entirely stopped. As a preventive of fires all unnecessary accumulations of wood and other combustible foreign matter have been taken out of the mines and fire-prevention appliances have been installed in each inside hoist room. The outside fire-prevention safeguards have been reinforced. All mines known to generate explosive gas will be put strictly on an electric-lamp basis. As soon as the lamps can be obtained, open lights will be eliminated.

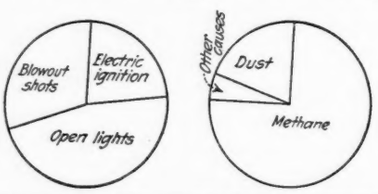
"At Hanna No. 2 a denial of the smoking privilege led a few men to leave their work, but the substantial men have expressed their approval of the additional safety afforded them by the entire elimination of open lights and matches. Where fans at mines making gas were electrically driven the motors have been disconnected and the more reliable steam-engine drive substituted, though the cost of power has been doubled or trebled thereby. Of late every safety lamp used for mine inspection is magnetically locked, requiring the fireboss to go to a lighting station before he can open his lamp for relighting. For the prevention of fires caused by short-circuits due to falls inside the mine electric circuit breakers have been purchased and will be installed as rapidly as possible.

"The Union Pacific Coal Co. management expects gradually to substitute mechanical loaders for the present method of hand loading within the mines, not in order, as has been suggested by a certain mine superintendent now much talked of in the public press, to make 'mindless machines of its employees' but instead to translate the job of producing foot-pounds with a shovel into that of operating a machine where the man can use his brains more and his back muscles less, and where the steel fingers of the loading machine will take the crushing that is now the lot of human fingers.

"In substance, the Union Pacific Coal Co. is officered by men who do not subscribe to the theory that 80 or 90 per cent of its employees lack the capacity of clear thinking and the ability to do more than shovel coal into a pit car."

Why Coal Mines Explode

In addressing the Rocky Mountain Coal Mining Institute D. Harrington declared that the ignition of methane is the initiating cause of probably 75 per cent of the coal-mine explosions in the United States, yet only in rare instances is there a widespread disaster in which methane furnishes all the fuel. Coal dust alone supplies the starting material for probably less than 20 per cent of our coal-mine explosions; on the other hand, it furnishes the propagating fuel for nearly all of the larger explosions of the present day and probably is responsible for much more than two-thirds of the loss of life which explosions cause.



PRIMARY AND SECONDARY CAUSES OF EXPLOSIONS

Wherever there are two causes there are two defenses. Thus with electric ignition we can suppress the spark (Defense No. 1) and remove the methane or wet down the dust (Defense No. 2).

Open lights have been the igniting cause of well over 50 per cent of our explosions, methane generally being the fuel, though under certain conditions coal dust can be ignited by the flame of a carbide lamp. Plain safety lamps, chiefly in the hands of firebosses or safety men, have caused several explosions with heavy loss of life; usually the lamps have been wrongly assembled or have been otherwise misused. While electricity has been the igniting agency in but a small percentage of our past explosions, it constitutes an ever-growing menace, and it is probable that at least 25 per cent of the present-day explosions are due to electric ignition. Electric arcs are particularly dangerous when fine dry coal dust is suspended in the air. Blown-out shots have caused at least one-third of the explosions that have occurred in the coal mines of the United States and in some coal-mining regions which have numerous explosions two-thirds of them may be ascribed to blown-out shots.

Clean Out Slack in Undercut To Get Lump Coal

BY W. J. GERMAN
Technical Representative,
E. I. duPont de Nemours & Co., Ltd.

Larger coal would be obtained, less explosive would be used, labor would be saved in preparing coal for loading and danger could be decreased by reason of the lessened use of powder or dynamite if the undercuttings made by machines were properly cleaned out.

If the undercuttings are not removed the coal does not have space in which to break down and consequently the explosive cannot do as much work as it should. At a few plants the miners have long-handled flat shovels for cleaning the cut, but more often they have no such tool, and many miners figure that they would rather use an extra stick of dynamite or a few more inches of powder than scrape out the cut.

Mine officials take care that the places are cut, but only a few of them see to it that the cuts are cleaned out so that full benefit of the cutting can be derived. Thus, although the coal mines have gone to a big expense to put machines in the mines to cut a space into which the coal can give way, half of this space frequently is lost by blasting the coal before the cuttings are cleaned out. As a result, a heavier charge of explosives must be used and mining costs are necessarily increased.

THE LEGALITY of bringing Indiana mines employing fewer than ten men under the jurisdiction of the State Department of Mines and Mining was discussed at a recent conference of the members of the mining board and U. S. Lesh, Attorney General of Indiana, says Cairy Littlejohn, secretary of the board. As a result of the conference the board has decided that no action can be taken at present, but the members of the board expressed willingness to attempt to bring about action by the next Legislature which would give the board the right to bring the mines employing fewer than ten men under the jurisdiction of the department.

Discussion

Says Sentiment for Oil Fuel Already Is Passing

The consumption of fuel oil in the territory that is served by the Colorado coal operators has considerably increased during the past three or four years. The installation of oil apparatus has taken quite a hold on the general public and we now find this sort of equipment being put into industrial plants as well as in the modern home.

The arguments for burning oil are: Cleanliness—no ashes, no clinkers, no soot, no dust—and automatic control of heat units, also the belief that oil is cheaper in the long run than coal, with the glittering promise held out that oil will remain at its present very low figure.

The facts of the case are these: Fuel-oil burning does not lessen the janitor's expense, but exacts a more technical and expensive service. Fuel oil does away with dust from ashes and worry of clinkers, but in place of those you have the filmy grime of oil in your home, which is more destructive to the hangings and decorations than that of coal and I have never yet come in contact with oil-burning apparatus which does not give off a distasteful smell, and constant noise and other inconveniences which are far more objectionable than that which comes from coal.

Now in regard to the cost: It takes about four barrels of oil, which delivered at the consumer's door, will average about $2.50 a barrel, to equal a ton of coal. In addition to this, you usually burn what is called a gas pilot, which will cost about $2.50 per month, or electricity for motor to pump oil, which will cost about $3 per month, and a failure of either of these delicate mechanisms to work means flooding your cellar with oil, which is a muss forlorn indeed.

In addition to this equipment depreciation, which is of a mechanism as sensitive and intricate as an automobile engine, oil-burning equipment is still in an experimental stage and its installation simply means additional plumbing bills, and outside of a few stations in temperate climates, the safety of being protected against cold snaps is very remote. Last year, during the cold snap, practically every oil burner east of the mountains failed to meet the test.

The present activity in oil fuel is without doubt due to the intensive selling campaign which has been put on by the manufacturers of oil-burning apparatus. The cost of these installations vary from $100 to $1,200 in residences and small apartments, and from $2,000 up for large heating units, and the depreciation must be reckoned with the service cost.

Taking these things into consideration, and from a survey made from installations that have been adapted in some of the industries and dwellings of this state, I feel certain that fuel oil will never displace coal. Like many other things that come along, it offers flattering prospects, but we have yet to find anyone who has installed the oil and used it for any length of time that will say that it is equal to coal for the purpose intended. I have in mind one town where forty-one fuel-oil installations were made last year, and nineteen of these have already gone back to coal.

Everyone knows that the oil industry has been, and is now, subject to greater manipulation of prices than any other industry and we feel certain that an explanation of these conditions to consumers will cause them to pause before changing from coal to oil.

F. R. WOOD,
President, Temple Fuel Co.
Denver, Colo.

What the Mine Inspector Can, May and Often Will Do

A large company that had been having trouble in bringing its workmen to co-operate with it by following safe practices decided to employ a company inspector. On his first visit he found many workmen who were breaking sound safety rules. When reprimanded the miners busied themselves to do as instructed. All went well till the workmen discovered that this new safety inspector was employed by the company and not by the state. Then they took an antagonistic attitude, and many left the company rather than do as the safety inspector desired and demanded.

This unpleasant situation has been satisfactorily met by asking the mine inspector to work with the company inspector in inducing the hard-headed workman to do as safety and the law demands. The state inspector is asked to take a hand in disciplining any recalcitrant provided he is worth the disciplining, and this he does without involving the company in any way. In this manner a good producer is made an all-around good workman, and the company profits in every way.

Many coal companies would get better results if they would take the initiative and bring problems of this kind before the state inspector, who is recognized as an arm of the law and respected accordingly. If the coal companies co-operated with the state inspector in this way safety practice would make a rapid step forward.

Pikeville, Ky. GEORGE EDWARDS.

Half Loaf Better Than No Bread

Though the application of water to the cutterhead of a machine described by John Walls, Sr., in the issue of *Coal Age* of Nov. 8, p. 710, is a most effective means of wetting coal dust and rendering it harmless, it is not necessary to continue our risky methods of dry undercutting even if we do not happen to have equipment for remodeling our machines so as to apply water in this manner.

In most cases the dust should be sprinkled as soon as the face is cut and the coal should be shot down before the dust has become dry. The coal should be sprinkled again before loading is commenced.

Gans, Pa. R. W. LIGHTBURN.

Rivals of Job

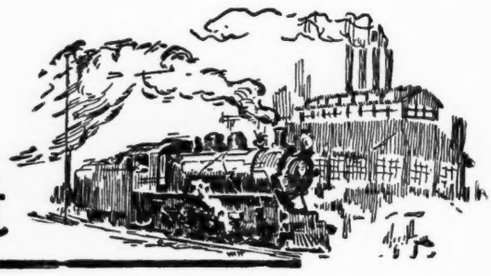
Coal operators need a wonderful sense of humor to get along. Either that, or they have been kicked so long and so often that a protective numbness deadens them to their difficulties in having to handle a hazardous and uncertain seasonal business, combining the vicissitudes of mining, transportation, and marketing, with public, politicians and labor unions making the job as hard for them as possible.

In this connection we learned the other day from newspapers that coal miners in the Hocking Valley were suffering from lack of work. A pathetic picture was painted of their deprivations, of their hardships, and of the wonderful feeling of brotherhood that glowed helpfully through their murky community like another light from Bethlehem. It was, indeed, an affecting pen picture. No work, no funds, no human aid but their own devotion and charity to each other.

Later we heard, quite incidentally (and you can wager safely that we didn't read it in a newspaper) that a certain coal mine in this same Hocking Valley had tried desperately and in vain to get its miners to work on the first day of the rabbit-hunting season. It was declared a holiday. That same week they refused again to work because it was Armistice Day.

Coal operators could make more money marketing the brand of philosophy which enables them to bear up under conditions such as these than they can, usually, by trying to keep people warm with their coal.—*Cleveland Topics.*

Production and the Market



Weekly Review

Seasonal inactivity in general industry has caused less spot buying of soft coal, with contract coals moving in good volume. Weather conditions dominated the markets last week and while little improvement was noticed in the wholesale trade, retail conditions were better. With consumers' inquiries constantly increasing indications point to heavier buying in January. Reports of wage reductions in non-union mines are current and while some have been reported in various West Virginia mines no general reduction has taken place yet nor is any now contemplated by operators. The greatest activity in the soft coal market is centered in the demand for screenings.

Production of soft coal continues to decline and seems to have settled definitely into a downward trend, as the Geological Survey estimates output during the week ended Dec. 8 to be 9,828,000 net tons, which, while an increase of 885,000 tons over the previous week, which contained a holiday, was 332,000 tons less than the week ended Nov. 24. As in the previous week lack of demand was the dominant factor in limiting production. Preliminary reports indicate a further cut in production last week.

Prices Show Firmer Tendency

Prices were a trifle stiffer last week, *Coal Age* Index showing 181 as of Dec. 17, a gain of one point and a return to the level of Dec. 3. The average price was $2.19. There were increases in southern Illinois, Mt. Olive, Clearfield, Somerset and Standard districts, with decreases in Kanawha and eastern Kentucky.

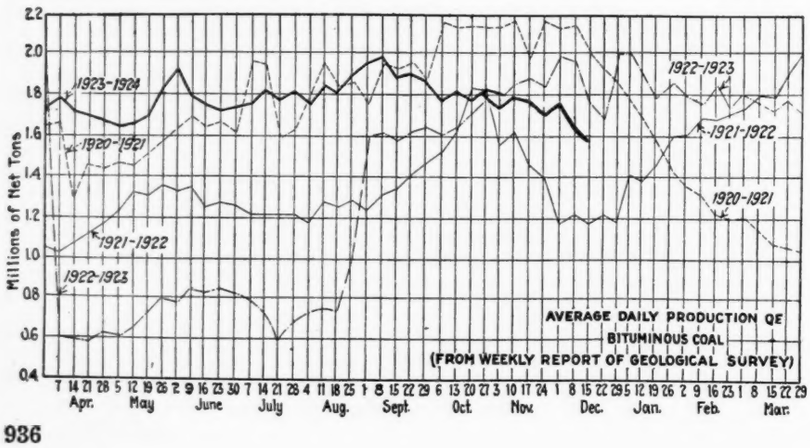
There is a little better tone in the Midwest markets due to reduced production, lower temperatures and the nearness of Jan. 1. Domestic coals from Illinois and Indiana move steadier but at low prices. Steam coals in all sections of the Middle West are firmer. The market at St. Louis continues quiet with the movement of coal depending on weather conditions. Screenings are the feature of the Kentucky markets and prices have advanced.

The Ohio markets felt the effects of more seasonable weather and although wholesale buying did not show any heavy increase, retail dealers were more active. New England reports a better tone, while the Atlantic seaboard market is dull and lifeless.

Hard-coal output fell short of 2,000,000 net tons by about 100,000 tons during the week ended Dec. 8, the Geological Survey estimating the production at 1,899,000 net tons. This was a gain of 151,000 tons over the Thanksgiving Day week, but 201,000 tons less than the week before. A strike last week at some of the large mines will affect the total output. Domestic coals are plentiful and quotations for independent product are easier. Stove and chestnut coals are more plentiful than egg and pea, while the steam coals are hard to move.

The lake season of 1923 virtually closed in the week ended Dec. 9, shipments of soft coal for that week amounting to 109,275 net tons of cargo coal and 7,451 tons of fuel coal. Total shipments of soft coal for the season, according to the Geological Survey, amounted to 31,296,778 net tons, of which 29,678,116 tons was cargo coal and 1,618,662 tons vessel fuel. During the 1922 season total shipments were 19,277,774 net tons; 1921, 23,171,449 tons, and 1920, 23,667,138 tons. Shipments of anthracite for the season amounted to 3,495,582 net tons, which was 153 per cent ahead of 1922, 18 per cent behind 1921, and 13 per cent less than in 1920.

Export shippers are receiving many inquiries but there is not much actual business being booked. Dumpings at Hampton Roads for all accounts during the week ended Dec. 13 amounted to 283,168 net tons, as compared with 308,305 tons the previous week.



Estimates of Production

(Net Tons)

	1922	1923
BITUMINOUS		
Nov. 24	11,100,000	10,160,000
Dec. 1 (*a*)	10,387,000	8,943,000
Dec. 8 (*b*)	11,495,000	9,828,000
Daily average	1,916,000	1,638,000
Calendar year	376,932,000	516,660,000
Daily av. cal. year	1,302,000	1,789,000
ANTHRACITE		
Nov. 24	2,213,000	2,100,000
Dec. 1	1,852,000	1,748,000
Dec. 8	2,075,000	1,899,000
Calendar year	48,793,000	89,958,000
COKE		
Dec. 1 (*b*)	298,000	245,000
Dec. 8 (*a*)	291,000	257,000
Calendar year	7,190,000	17,194,000

(*a*) Subject to revision. (*b*) Revised from last report.

More Life in Midwest Now

Low production, cooler days, and the approach of Jan. 1 have combined to give the Midwest coal market a little better tone. Domestic coals produced in Illinois and Indiana are moving more steadily but in very small volume at the present low prices. Southern Illinois prime lump at $3.75, though unpopular with many dealers who stocked before the recent cut, is barely attractive enough to start movement, and Indiana No. 4 lump at $3.25 and central Illinois lump at $2.75@$3 show about the same degree of activity. Smokeless mine-run, competitor of these coals, is stiffening up somewhat. The old $1.40@$1.50 smokeless prices have about disappeared; $1.75 was the average at the end of the week and the trend was upward.

Steam coals everywhere in the Midwest are firmer. Southern Illinois Association producers are trying to reach the $2 mark with screenings during this week, and were running from $1.75 to $1.90 by the end of last. Central Illinois screenings—what there is available after the Standard Oil $1.25 contracts have been filled—move readily at $1.50. Indiana steam coals also have improved about 10c. and are scheduled to go much higher, especially in view of the shutdown of three more big mines and another handful of small ones. There is much inquiry about storage coal to be shipped after Jan. 1. Many buyers are convinced that there is to be a strike, but operators are saying little.

In the Mt. Olive field there are no price changes. A little domestic is moving and screenings are in good demand, but nut and egg are slow. Generally, business in that field is far below what is considered bad. In the Standard field screenings are strong and the small sizes of nut are moving, but domestic is still poor. A little moves, but so little that it is hardly a factor. Cars are plentiful. Railroad tonnage in the Mt. Olive and Standard fields is running light. Mines work from one day in two weeks to as many as four days in rare instances.

St. Louis Idle but Noisy

Business continues quiet in St. Louis. Chilly weather moves a little coal of the cheaper grades in small lots. Demand is light for anthracite, smokeless and coke, and Carterville is slowing up. Retailers who stored heavily on

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Dec. 18 1922	Dec. 3 1923	Dec. 10 1923	Dec. 17 1923†
Smokeless lump	Columbus	$6.30	$4.10	$3.75	*$3.25@$3.50*
Smokeless mine run	Columbus	6.00	2.10	2.10	2.00@ 2.25
Smokeless screenings	Columbus	5.50	1.30	1.25	1.20@ 1.35
Smokeless lump	Chicago	7.75	4.10	3.35	3.25@ 3.50
Smokeless mine run	Chicago	6.60	2.00	1.75	**1.65@ 2.00**
Smokeless lump	Cincinnati	7.00	3.10	3.50	*2.75@ 3.50*
Smokeless mine run	Cincinnati	5.80	2.00	2.00	1.75@ 2.25
Smokeless screenings	Cincinnati	5.30	1.35	1.50	1.25@ 1.75
*Smokeless mine run	Boston	7.85	4.60	4.50	*4.35@ 4.50*
Clearfield mine run	Boston	4.15	1.85	1.85	**1.60@ 2.25**
Cambria mine run	Boston	4.55	2.50	2.35	2.00@ 2.75
Somerset mine run	Boston	4.10	2.10	2.10	**1.85@ 2.50**
Pool 1 (Navy Standard)	New York	5.75	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Philadelphia	5.35	3.00	3.00	2.75@ 3.20
Pool 1 (Navy Standard)	Baltimore	5.75	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	5.15	2.35	2.25	2.00@ 2.50
Pool 9 (Super. Low Vol.)	Philadelphia	4.85	2.30	2.35	2.25@ 2.50
Pool 9 (Super. Low Vol.)	Baltimore	5.05	2.05	2.25	2.25
Pool 10 (H.Gr.Low Vol.)	New York	4.50	2.00	1.95	**1.75@ 2.25**
Pool 10 (H.Gr.Low Vol.)	Philadelphia	4.15	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Baltimore	4.55	1.90	2.20	2.20
Pool 11 (Low Vol.)	New York	3.50	1.65	1.80	*1.50@ 1.75*
Pool 11 (Low Vol.)	Philadelphia	3.55	1.70	1.65	1.60@ 1.75
Pool 11 (Low Vol.)	Baltimore	4.10	1.75	1.90	1 90
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	3.20	1.60	1.60	1.50@ 1.75
Pool 54-64 (Gas and St.)	Philadelphia	3.35	1.65	1.60	1.55@ 1.75
Pool 54-64 (Gas and St.)	Baltimore	3.85	1.70	1.85	1.85
Pittsburgh sc'd gas	Pittsburgh	5.25	2.55	2.55	2.50@ 2.60
Pittsburgh gas mine run	Pittsburgh	..	2.25	2.25	2.20@ 2.30
Pittsburgh mine run (St.)	Pittsburgh	2.60	2.00	2.05	2.00@ 2.10
Pittsburgh slack (Gas)	Pittsburgh	3.25	1.30	1.50	1.50
Kanawha lump	Columbus	5.35	3.00	3.00	*2.75@ 3.00*
Kanawha mine run	Columbus	3.00	1.85	1.85	*1.50@ 1.75*
Kanawha screenings	Columbus	2.80	.80	.80	**.90@ 1.00**
W. Va. lump	Cincinnati	6.25	2.75	2.85	2.50@ 3.25
W. Va. Gas mine run	Cincinnati	3.35	1.50	1.60	1.50@ 1.75
W. Va. Steam mine run	Cincinnati	3.10	1.50	1.60	1.50@ 1.75
W. Va. screenings	Cincinnati	3.00	.50	.85	*.65@ 1.00*
Hocking lump	Columbus	5.15	2.95	2.95	*2.85@ 3.00*
Hocking mine run	Columbus	2.60	1.85	1.85	1.75@ 2.00
Hocking screenings	Columbus	2.55	.80	1.05	**1.10@ 1.25**
Pitts. No. 8 lump	Cleveland	4.35	2.55	2.45	1.90@ 3.00
Pitts. No. 8 mine run	Cleveland	3.20	1.90	1.95	1.90@ 2.00
Pitts. No. 8 screenings	Cleveland	3.05	1.40	1.35	**1.60**

Midwest	Market Quoted	Dec. 18 1922	Dec. 3 1923	Dec. 10 1923	Dec. 17 1923†
Franklin, Ill. lump	Chicago	$5.25	$4.10	$3.60	$3.50@$3.75
Franklin, Ill. mine run	Chicago	4.10	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings	Chicago	2.70	1.55	1.70	**1.75@ 1.90**
Central, Ill. lump	Chicago	4.25	3.10	3.00	2.75@ 3.25
Central, Ill. mine run	Chicago	3.10	2.10	2.10	2.00@ 2.25
Central, Ill. screenings	Chicago	2.00	1.35	1.45	**1.50**
Ind. 4th Vein lump	Chicago	5.10	3.35	3.25	3.00@ 3.50
Ind. 4th Vein mine run	Chicago	3.85	2.60	2.60	2.50@ 2.75
Ind. 4th Vein screenings	Chicago	2.25	1.55	1.65	**1.65@ 1.80**
Ind. 5th Vein lump	Chicago	4.75	2.50	2.50	2.25@ 2.75
Ind. 5th Vein mine run	Chicago	3.60	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	1.95	1.30	1.45	**1.50**
Mt. Olive lump	St. Louis	.....	3.10	3.00	**3.00@ 3.25**
Mt. Olive mine run	St. Louis	.....	2.25	2.25	**2.50**
Mt.Olive screenings	St. Louis	.....	1.25	1.55	**1.75**
Standard lump	St. Louis	4.10	3.05	2.85	2.75@ 3.00
Standard mine run	St. Louis	2.10	2.05	2.05	*1.90@ 2.00*
Standard screenings	St. Louis	1.35	.55	1.15	**1.25@ 1.50**
West Ky. lump	Louisville	3.85	3.00	3.00	2.75@ 3.25
West Ky. mine run	Louisville	2.25	1.70	1.70	**1.50@ 2.00**
West Ky. screenings	Louisville	1.80	.70	1.00	**1.00@ 1.35**
West Ky. lump	Chicago	3.85	2.85	2.85	2.75@ 3.00
West Ky. mine run	Chicago	2.60	1.75	1.75	1.50@ 2.00
South and Southwest					
Big Seam lump	Birmingham	3.95	3.85	3.85	3.75@ 4.00
Big Seam mine run	Birmingham	2.35	1.95	1.95	1.75@ 2.15
Big Seam (washed)	Birmingham	2.60	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Chicago	6.25	3.10	3.10	3.00@ 3.25
S. E. Ky. mine run	Chicago	3.85	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	6.35	3.35	3.35	*2.75@ 3.50*
S. E. Ky. mine run	Louisville	3.35	1.75	1.75	1.50@ 2.00
S. E. Ky. screenings	Louisville	3.25	.80	.75	**1.00@ 1.35**
S. E. Ky. lump	Cincinnati	5.85	3.00	3.10	*2.50@ 3.25*
S. E. Ky. mine run	Cincinnati	3.15	1.50	1.55	1.35@ 1.75
S. E. Ky. screenings	Cincinnati	2.75	.65	.95	**.75@ 1.25**
Kansas lump	Kansas City	5.25	5.10	4.75	4.50@ 5.00
Kansas mine run	Kansas City	3.60	3.25	3.25	3.00@ 3.50
Kansas screenings	Kansas City	2.50	2.00	2.00	2.00

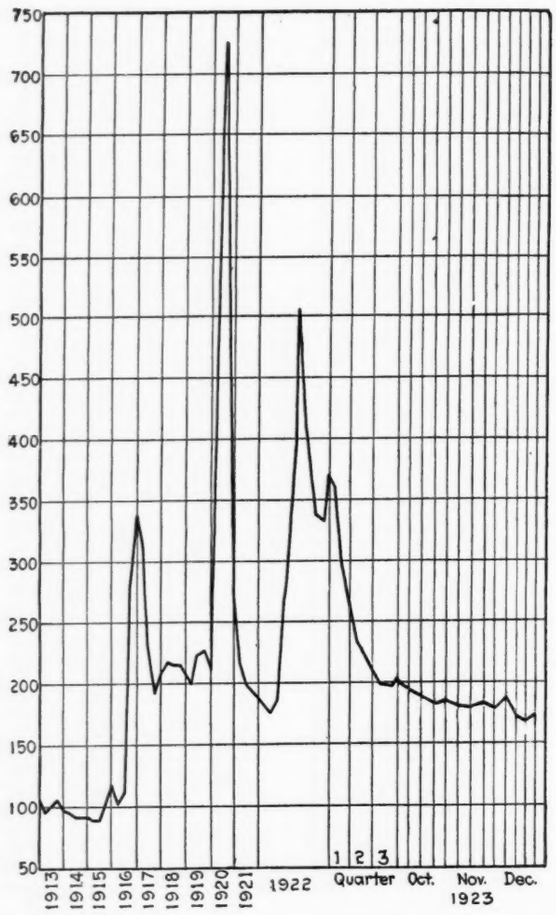
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Dec. 26, 1922 Independent	Dec. 26, 1922 Company	Dec. 10, 1923 Independent	Dec. 10, 1923 Company	Dec. 17, 1923† Independent	Dec. 17, 1923† Company
Broken	New York	$2.34	$9.00	$7.75@$8.25	$8.50@10.00	$8.00@$9.25	$8.50@$10.00	$8.00@$9.25
Broken	Philadelphia	2.39	.....	7.90@ 8.10	.....	.....	.....	.....
Egg	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@11.00	8.75@ 9.25	*9.85@10.50*	8.75@ 9.25
Egg	Philadelphia	2.39	9.25@11.00	8.10@ 8.35	9.85@12.20	8.75@ 9.25	9.85@12.20	8.75@ 9.25
Egg	Chicago*	5.06	12.50@13.00	7.20@ 8.25	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Stove	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@12.00	8.75@ 9.25	*9.85@11.00*	8.75@ 9.25
Stove	Philadelphia	2.39	9.25@11.00	8.15@ 8.35	9.85@12.20	8.90@ 9.25	9.85@12.20	8.90@ 9.25
Stove	Chicago*	5.06	12.50@13.00	7.35@ 8.25	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Chestnut	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@12.00	8.75@ 9.25	*9.85@11.00*	8.75@ 9.25
Chestnut	Philadelphia	2.39	9.25@11.00	8.15@ 8.35	9.85@12.20	8.90@ 9.25	9.85@12.20	8.90@ 9.25
Chestnut	Chicago*	5.06	12.50@13.00	7.35@ 8.35	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Range	New York	2.34	.....	8.25	.....	9.00	.....	9.00
Pea	New York	2.22	7.00@11.00	6.15@ 6.30	6.00@ 7.25	6.15@ 6.65	6.00@ 7.25	6.15@ 6.65
Pea	Philadelphia	2.14	7.00@ 8.00	6.15@ 6.20	6.75@ 9.00	6.35@ 6.60	*6.35@ 7.50*	6.35@ 6.60
Pea	Chicago*	4.79	7.00@ 8.00	5.49@ 6.03	6.00@ 6.75	5.40@ 6.05	6.00@ 6.75	5.40@ 6.05
Buckwheat No. 1	New York	2.22	4.00@ 5.00	4.00@ 4.10	1.75@ 3.50	3.50	*2.00@ 3.00*	3.50
Buckwheat No. 1	Philadelphia	2.14	5.00	4.00	2.25@ 3.50	3.50	2.25@ 3.50	3.50
Rice	New York	2.22	3.00@ 3.25	2.75@ 3.00	1.35@ 2.50	2.50	*1.35@ 2.25*	2.50
Rice	Philadelphia	2.14	2.50@ 2.75	2.75@ 3.00	1.75@ 2.50	2.50	1.75@ 2.50	2.50
Barley	New York	2.22	1.75@ 2.00	1.50@ 2.00	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley	Philadelphia	2.14	1.00@ 1.75	2.00	1.00@ 1.50	1.50	1.00@ 1.50	1.50
Birdseye	New York	2.22	.....	2.10	1.25@ 1.45	1.60	1.25@ 1.45	1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

	1923			1922
	Dec. 17	Dec. 10	Dec. 3	Dec. 18
Index	181	180	181	336
Weighted average price	$2.19	$2.18	$2.19	$4.07

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally, shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

Franklin County coals are doomed to take a heavy loss on the Dec. 8 cut in mine price. The feeling generally is not kindly to the operator who makes it possible to buy coal cheaper in midwinter, when screenings are low, than in midsummer, when screenings were high and working time better. Meetings of dealers in St. Louis, Springfield and other places made this a topic for much discussion.

The feature of the week in Kentucky was the advance in the price of screenings, which has mounted to a level starting at $1 a ton, with some operators refusing anything under $1.10 and ranging to $1.35 for nut and slack, the latter grade bringing 15c. or 20c. a ton more than pea and slack. Mine-run and prepared sizes remain unchanged and the advance in screenings is bringing the mine-run average up to a level where the field will reduce its losses materially. Eastern Kentucky screenings are in line with those of western Kentucky, while the latter fields has an advantage of 43c. to 63c. over eastern Kentucky in getting into the Louisville market, and a good movement South, West and North.

Cold weather is finally at hand, with snowfalls reported over the state, and prospects of some business are now apparent. Retailers are getting more inquiries, and placing just a little better volume of business. If the mines that are now down stay down all month, the market will be much stronger by Jan. 1. Car supply is excellent. The landslide which shut off Hazard field a week ago is now cleared.

Northwest Ready for Strike

The last cargo of coal for the 1923 season arrived at the Head-of-the-Lakes on Dec. 11. Stocks on docks at Dec. 1 were 5,873,000 tons of soft coal and 236,000 tons of hard coal. The soft-coal stocks leave a plentiful supply against any possible shortage by a strike in April. Stocks of anthracite are a disappointment, especially as most of the desirable sizes are missing. Prices are unchanged.

The tendency of the screening market is stronger, this being due to a shortage, which is more feared than manifest at present. The demand for soft coal is light, and it is obvious that the buyers are waiting for a break in the market. The general opinion is that a break will come because of the stocks on hand and the fact that many consumers are well supplied.

At Milwaukee the demand, which fluctuates with weather conditions, is hardly up to what would be expected at this season. Prices remain steady. The last cargo of coal of the season was docked on Dec. 11. The total cargo receipts since the opening of navigation in May aggregated 971,824 tons of anthracite and 3,233,122 tons of soft coal, or 4,204,946 tons in all.

Western Business Spotted

The coming of real winter weather brought more business to Salt Lake City retailers than they have had heretofore this season. They are able, however, to take care of all demands. As a rule the dealers show no desire to stock up for an emergency but are trusting the operating companies to make deliveries as needed. Supplies in local yards are down to about 35,000 tons.

Colorado noted little change in the coal market during the week, the only demand being for domestic sizes. The majority of the operators are still reporting "no market." Prices in the Trinidad district have dropped 50c. so that lump is now $4@$4.50. Labor seems plentiful and the transportation situation is good.

With Southwestern mines working three and four days a week, "no bills" still are accumulating. In the last few weeks there has been a pronounced increase in the surplus of domestic sizes. The surplus of screenings is lessening, but earlier experiences of the year have shown such relief to be only temporary. Operators insist that with screenings at their present price many industries would cut back from oil to coal were it not for the uncertainty of supply.

Lower Temperatures Stimulate Ohio Trade

Slightly colder weather had a stimulating effect on the Ohio coal markets. At Columbus, however, the demand for domestic coals is not active and retail dealers are cleaning up before placing new orders, as they have considerable high-priced coal on hand. Smokeless grades weakened, as well as Ohio-mined coals. Steam trade is slow because of heavy reserves, while purchasing agents are looking for bargains. The Southern Ohio Coal Exchange reports a total output of 131,602 tons during the week ended Dec. 1, with 446 mines reporting, with a full-time capacity of 582,149 tons. "No market" was responsible for a loss of 408,595 tons. Smokeless business at Cincinnati is in a rut as far as prepared sizes are concerned. Reports of mines closing continue to be received in that city and it is said that several operations in Logan County, West Virgina, have announced that they will not turn a wheel from Dec. 20 to Jan. 1. Mild weather has forced the domestic prices down, and consigned and distress coal has been well cleaned up. There has been no change in retail prices.

There has been a demand for slack in the Cleveland market, accompanied by an advance in prices. The only other betterment noted in the situation is a slight improvement in the retail market, due to lower temperatures. Mines in eastern Ohio produced 317,000 tons, or about 45 per cent of capacity, during the week ended Dec. 8.

The Pittsburgh market did not grow any worse last week, nor did it seem to have improved materially. There may, however, have been a slightly heavier demand, chiefly on

account of more domestic distribution. Steel mills are running a trifle lighter, but that is attributed to seasonal conditions, and expect to be operating more heavily next month. Production in the Pittsburgh district is now running at about 60 per cent of rated capacity. Low prices are ruling in nearby non-union regions, presenting more competition for sellers of regular Pittsburgh coal.

Business in central Pennsylvania is dull, although some operators in and about Johnstown think there has been some improvement. Improvement in orders received for immediate shipment has resulted in increased working time.

There was a small stir in demand for slack in and around Buffalo, but it was not of considerable moment. Consumers do not appear to be interested, although colder weather is due.

Better Tone to New England Market

While quotations in New England are as yet little changed there is a rather better tone to the market so far as price is concerned. No. 1 Navy Standard grades can still be had at $4.35@$4.50 per gross ton, f.o.b. vessel at Hampton Roads, but on cars at Providence, Boston and Portland the various distributors are asking more money and in some instances are making sales at $6 on cars, a level that is 25c. to 50c. higher than a week ago.

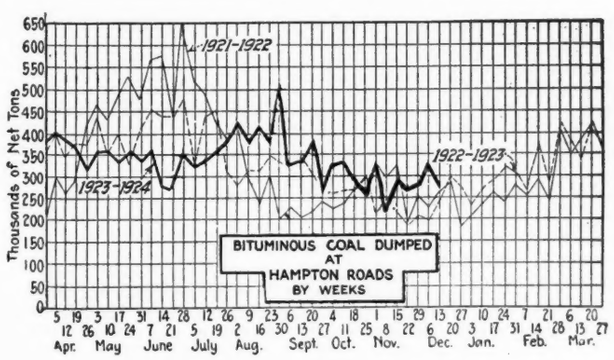
Accumulations at Hampton Roads are still large in proportion to current output. Several groups of mines are operating only two or three days weekly but yet there is a surplus far exceeding present requirements. Practically all the rehandling factors are carrying heavy stocks and the agencies at Hampton Roads are at a loss to know where to place January coal. The industries in New England show no substantial improvement, and until there is pronounced strike talk in bituminous for next April it is not probable that there will be any marked increase in demand.

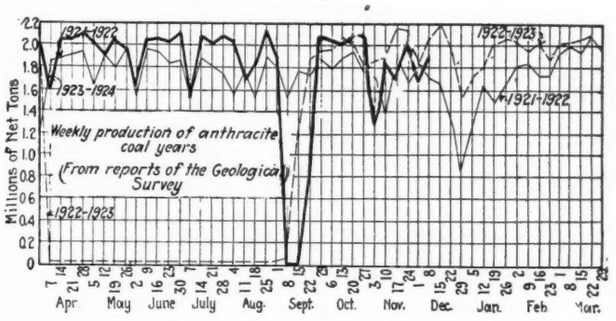
For Pennsylvania coals the prospect is no more inviting than at any time during the last sixty days. Quotations are at a minimum. Bituminous traffic via New York and Philadelphia piers has shown a further shrinkage since Dec. 1, and aside from moderate deliveries on season contracts there is little tonnage moving.

Seaboard Market Dull

There are no signs of an awakening in the soft-coal trade along the Atlantic seaboard. Demand remains quiet and with the exception of a few small orders salesmen report "nothing doing." Receipts at the New York tidewater docks are somewhat heavier while inquiry shows comparatively little improvement. Cars reported at the various docks on Dec. 14 amounted to 1,983, while daily dumpings for the first five days of the week ended Dec. 15 averaged 371. Consumers are "feeling" the market and operators are hopeful of better conditions after Jan. 1. At Philadelphia there are no visible signs of better conditions in the near future. It is believed that the bottom in prices has been reached. Tidewater trade at Philadelphia remains inactive. Bunkering is light and there is little coal at the piers. Conditions at Baltimore have not improved and dealers do not see any immediate change for the better ahead.

Whatever change has taken place in West Virginia has been confined for the most part to slack, which in the southern high-volatile fields ranged during a few days last week


1921-1922
1922-1923
1923-1924
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Thousands of Net Tons
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.



from 90c. to $1, and in northern West Virginia from $1.25 to $1.40, and in some instances as high as $1.50. The market at Birmingham is slow and sluggish. General demand for spot steam coal is light while the domestic situation is controlled by weather conditions. Production in the Birmingham field for the week ended Dec. 1 was reported as 340,000 net tons.

Independent Anthracite Quotations Lower

Demand for the domestic sizes of anthracite is much easier, especially for independent product, and there has been an accompanying drop in quotations in the New York market. Company coals are going to the retail dealer in larger tonnages and some operators and shippers of independent product have found it necessary to look for orders. Egg and pea coals are the hardest to move, some shippers of the latter size finding it necessary to sell it in conjunction with either stove or chestnut size. Colder weather and a slight snowfall, the first of the present season, created a little better but temporary retail demand both at New York and Philadelphia. Most retail dealers have all sizes for immediate delivery and in New York some retailers have their books well cleaned up and are ready to book new business. The steam coals are moved slowly. Barley is the shortest of the three coals and is in better demand than either buckwheat or rice.

Production of beehive coke during the week ended Dec. 8 is estimated by the Geological Survey to have been 257,000 net tons, a gain of 12,000 tons over the previous week. Output of beehive coke during November was 1,103,000 net tons and of byproduct coke 2,942,000 tons, as compared with 1,290,000 tons and 3,099,000 tons, respectively, during October. Last week the Connellsville coke market failed to develop any additional activity. Spot furnace coke was quotable at $4, with foundry coke for spot or prompt shipment at $5@$5.50. Two producers of high-grade coke have quotations out for the first quarter, one at $6.50 and the other at $6.

Car Loadings, Surplusages and Shortages

	Cars Loaded—All Cars	Cars Loaded—Coal Cars
Week ended Dec. 1, 1923	835,296	156,608
Previous week	990,217	182,158
Same week in 1922	840,412	183,510

	Surplus Cars—All Cars	Surplus Cars—Coal Cars	Car Shortage	
Nov. 30, 1923	153,057	80,756	1,336	605
Same date in 1922	5,595	2,026		
Nov. 22, 1923	111,797	58,490	1,866	907

Coal Recovered and Lost in Mining

		Per Cent of Coal in Mine Lost	Per Cent of Coal in Mine Recovered	Tons Lost per Ton Produced
Anthracite	1850	75	25	3.00
	1880	60	40	1.50
	1921	38.9	61.1	.64
	Future	30	70	.43
Bituminous	1850	64	36	1.78
	1880	50	50	1.00
	1921	34.7	65.3	.53
	Future	15.3	84.7	.18

Looking back 70 years, few industries can show the progress recorded in these figures for the coal industry.—*From U. S. Coal Commission Report on Engineering and Management.*

Foreign Market And Export News

Improvement in Welsh Coal Market; Output Declines Slightly

Some improvement is noted in the Welsh coal market. Long delayed tonnage is coming to hand freely, and operators and consumers realize that deliveries, owing to the prolonged stormy weather, and the consequent delays of tonnage have fallen behind. The docks are filled with ships and loading operations are proceeding as rapidly as possible.

France is buying well, but with other near-by Continental countries there is no marked activity. Trade with Italy and South America is steady, and a feature of the market is a keen inquiry on the part of buyers seeking to cover fully their requirements to the close of the year. Up to the present Germany's coal credits have not stimulated business in that direction.

The six months trial period of the three shift system at the South Wales ports has expired, but, according to a newspaper dispatch, the tippers have consented to continue at work until Jan. 5, pending further negotiations.

The Newcastle coal market continues to improve. There have been heavy bookings for shipment up to the end of the year and the supply of tonnage has been good.

The report of the loan to Germany to buy steam coals for the railways has been followed by heavy contracts being made all over the country.

Active inquiry from abroad is supplemented by increasing domestic trade demands now that the shipbuilders are resuming work, and the iron and steel operators are extending their operations to meet an expanding trade.

Production of coal by the British mines during the week ended Dec. 1 was 5,719,000 tons, according to a cable to *Coal Age*, a decline of 7,000 tons when compared with the previous week.

Ruhr Industrialists Make Agreement

Announcement has been made in France that agreements with the Ruhr industralists were made on Nov. 23 to remain effective until April 15 next. They include payment of about 279,000,000 fr. as coal tax due from the date of occupation to the time the agreement was made; payment of 10 fr. per ton of coal sold as a tax from Nov. 23; during the period of reorganization of the mines and plants which it is expected will be completed on Jan. 15 next, 18 per cent of the coal produced will be assigned to the Allies as reparation deliveries; free deliveries to begin Jan. 15 next of the monthly supplies prescribed by the Commission for Reparations, in accordance with the peace treaty; free deliveries of by-products; delivery to the Allies of the coal necessary for the needs of the occupation armies as well as for the railroads; acceptance by the German industrialists, according to established regulations, of the control of the mines by Allied engineers; maintenance of export licenses and limitation of exports in the Ruhr.

Export Market Lightens Gloom At Hampton Roads

Business was dull at Hampton Roads last week, with prices showing little change, and with inquiries slackening. Some improvement in export business was shown, although the coastwise trade barely held its own.

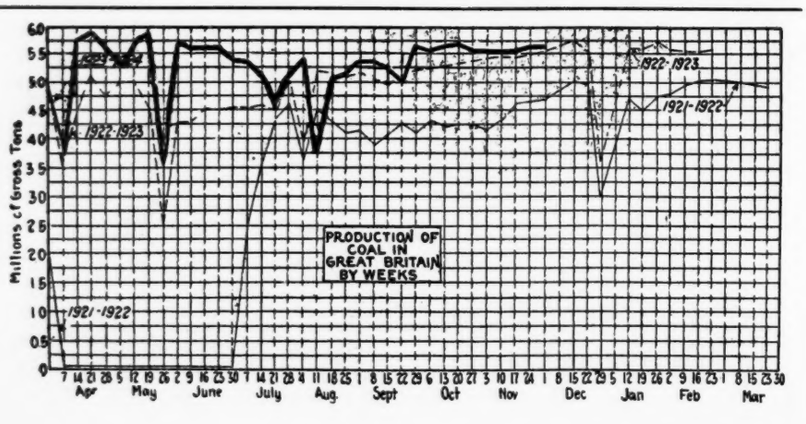
The Virginian Ry., partially tied up for several weeks by its engineers' strike, moved slightly more coal, while usually favorable conditions on the Norfolk & Western enabled large volumes of coal to move and to ward off any scarcity of the product.

No outstanding feature was seen in the market. The export cargoes reported were shopped at exceedingly low figures, mainly in an effort to keep coal off demurrage. The tone of the market was dull, and the prospect for the next few weeks was reported as not bright.

Coal Paragraphs from Foreign Lands

Imports of coal into Rio de Janeiro during September amounted to 58,808 metric tons as compared with 85,654 tons during August. Of the total tonnage the United States furnished 7,522 tons and Great Britain 51,286 tons, according to the United States Department of Commerce. Imports of coal during the first nine months of this year were 720,314 metric tons, as compared with 689,798 tons in 1922, and 558,344 tons in 1921.

Coal shipments for the season from Spitzbergen were about 400,000 metric tons, according to Consul George Nicolas Ifft, at Bergen, Norway, in his report to the Department of Commerce at Washington. These reports are based on returns from the principal coal companies operating on the island. Shipments are ended for the season.



Export Clearances, Week Ended Dec. 15, 1923

FROM HAMPTON ROADS

	Tons
For Brazil:	
Amer. SS. Robin Hood, for Rio de Janeiro	8,459
For Mexico:	
Nor. SS. Skogheim, for Vera Cruz	3,899
For Porto Rico:	
Amer. SS. Beatrice, for San Juan	4,662
For Uruguay:	
Grk. SS. Aghios Marcos, for Montevideo	5,819
For Cuba:	
Amer. Schr. Laura Annie Barnes, for Manzanillo	1,073
For Virgin Islands:	
Br. SS. Berwindvale, for St. Thomas	7,647
For Jamaica:	
Amer. SS. Annetta, for Port Antonio	202

FROM PHILADELPHIA

For Cuba:	
Am. Schr. Irma, for Niquero	....
For Brazil:	
Br. SS. Dovenbay Hall, for Rio de Janeiro	...

FROM BALTIMORE

For Porto Rico:	
Am. SS. Major Wheeler (coke)	497

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.:	Dec. 6	Dec. 13
Cars on hand	1,581	2,200
Tons on hand	92,373	125,575
Tons dumped for week	123,709	108,643
Tonnage waiting	15,375	12,000
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,246	1,244
Tons on hand	71,850	73,950
Tons dumped for week	31,924	65,493
Tonnage waiting	.....	1,040
C. & O. piers, Newport News:		
Cars on hand	1,316	1,560
Tons on hand	67,458	78,515
Tons dumped for week	119,640	78,693
Tonnage waiting	5,950	690

Pier and Bunker Prices, Gross Tons

PIERS

	Dec. 8	Dec. 15†
Pool 9, New York	$5.00@$5.25	$5.00@$5.25
Pool 10, New York	4.75@ 5.00	4.75@ 5.00
Pool 11, New York	4.50@ 4.75	4.50@ 4.80
Pool 9, Phi.adelphia	4.90@ 5.20	4.90@ 5.20
Pool 10, Philadelphia	4.50@ 4.90	4.50@ 4 90
Pool 11, Philadelphia	4.25@ 4.60	4.25@ 4.60
Pool 1, Hamp. Roads	4.60@ 4.75	*4.50*
Pools 5-6-7 Hamp. Rds.	4.15@ 4.30	4.15@ 4.30
Pool 2, Hamp. Roads	4.25@ 4.40	*4.25*

BUNKERS

Pool 9, New York	5.30@ 5.55	5.30@ 5.55
Pool 10, New York	5.05@ 5.30	5.05@ 5.30
Pool 11, New York	4.80@ 5.05	4.80@ 5.15
Pool 9, Philadelphia	5.15@ 5.55	5.15@ 5.55
Pool 10, Philadelphia	4.90@ 5.25	4.90@ 5.20
Pool 11, Philadelphia	4.65@ 4.90	4.65@ 4.90
Pool 1, Hamp. Roads	4.60@ 4.75	*4.50*
Pool 2, Hamp. Roads	4.25@ 4.40	*4.25*

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	Dec. 8	Dec. 15†
Admiralty, large	29s.6d.@30s.	29s.6d.@30s.
Steam smalls	20s.@22s.	**22s.6d.@25s.**
Newcastle:		
Best steams	24s.6d.@26s.6d.	**26s.6d.**
Best gas	23s.6d.@24s.	**24s.@24s.6d.**
Best bunkers	22s.6d.@24s.6d.	**23s.@24s.**

† Advances over previous week shown in **heavy type**, declines in *italics*.

Traffic News

Virginian Ry. Authorized to Extend Guyandot River Branch

The Interstate Commerce Commission on Dec. 14 granted permission to the Virginian Ry. to construct an extension of its Guyandot River branch in Wyoming County, West Virginia, for 1.19 miles to serve new coal mines. This reversed its order of June 25, which denied the road's request.

The construction cost of the extension is estimated by the applicant at $63,012, of which $40,812 has been expended for work done in 1917 and 1918. Gross system revenues to be derived from traffic created by the proposed construction are estimated by the applicant at $226,000 for the first year, increasing to $1,130,000 for the fifth year. After the first five years the minimum annual revenues are expected to equal those of the fifth year. The increase in net railway operating income is estimated at $77,309 the first year and $393,234 the fifth year.

The commission originally denied the application on the ground that the Virginian had not been able to supply the mines in operation on its lines and that, in addition, there were more mines in the country than was consistent with the most efficient use of equipment.

Application was filed by the railway company for a reopening of the case and the railway was joined in this move by the Pocahontas Fuel Co., Inc., the properties of which were to be served by the proposed extension.

The evidence taken shows that the tractive power of locomotives owned by the Virginian road on Jan. 1, 1922, has been increased 16.4 per cent by the purchase of fifteen Mallet locomotives, which were delivered between July 1 and Sept. 1, 1923. On April 13, 1923, the railway ordered 1,000 steel coal cars of 120 tons' capacity, and 500 of seventy tons' capacity, which will add 30 per cent to its coal car capacity. A contract has been made to electrify part of the lines, and this will add materially to the carrying capacity.

Defer Assigned-Car Order Again

The Interstate Commerce Commission has again postponed the effective date of the assigned-car order, this time from Jan. 1 until Feb. 1.

Suspends New Switching Rate

The Interstate Commerce Commission has ordered suspension until April 3 next of schedules proposed to increase from $3.60 per car to $8.10 per car the switching charge of the Wheeling & Lake Erie Ry. on coal and coke received at Toledo, Ohio, from other lines and destined to industries located in Toldeo switching limits upon the line of the Wheeling & Lake Erie Ry.

All Freight Records Broken

The railroads of the United States handled 386,027,840,000 net ton-miles of freight traffic during the first ten months of 1923, breaking all past records and an increase of 2.4 per cent over the corresponding period in 1920, when freight traffic amounted to 377,025,000,000 net ton-miles, the previous high record, according to the Bureau of Railway Economics. Compared with the first ten months last year, the total for the same period in 1923 was an increase of 84,495,486,000 net ton-miles, or 28 per cent.

For the month of October this year alone the freight business of the railroads amounted to 42,209,395,000 net ton-miles, which has been exceeded only in August, 1920, when it amounted to 42,734,000,000, and in October, 1920, when it was 42,570,000,000. Compared with October last year, it was an increase of 2,922,541,000, or more than 7 per cent.

October this year was the eighth month in history when freight traffic on the railroads has exceeded 40,000,000,000 net ton-miles. This mark was attained once in 1918, again in 1919, and four times in 1920. It was not reached in 1921 or 1922, but so far has been reached twice in 1923.

Dates Set for Lignite Hearing

The Interstate Commerce Commission on Dec. 14 set dates for hearings of the protest filed against proposed increases on lignite rates out of North Dakota. The first hearing will be held at Aberdeen, S. D., on Jan. 7, and a second at Bismarck, N. D., on Jan. 10. Governor Nestos of North Dakota recently urged President Coolidge to assist coal interests in that state in resisting the increase, whereupon the new rate schedules were promptly suspended.

New Connection for Ohio Mines

The struggles of a number of small operators near Dover, Tuscarawas County, Ohio, for railroad connections which would enable them to market their product, started a year ago have been crowned with success. The Ohio Utilities Commission has ordered the Pennsylvania R.R. to make the necessary connections. The case was carried to the Supreme Court by the railroad company but that tribunal upheld the order of the Ohio Utilities Commission.

Would Build Alabama Line

The Muscle Shoals, Birmingham & Pensacola Ry. has applied to the Alabama Public Service Commission for a certificate of convenience and necessity for the construction of a railroad from Kimbrough, the present northern terminus of the line, to Jasper, Ala. It is contended that the new line will shorten the distance between central points and the gulf and will also open coal and ore fields and timber tracts in North Alabama not now served by any railroad.

Ford Seeks 43-Mile Cut-Off

The Detroit, Toledo & Ironton R.R., Henry Ford's road, asked the Interstate Commerce Commission Dec. 15 to authorize a new forty-three-mile line between Wauseon, Ohio, and Durban, Mich., for which permission was sought to issue sufficient mortgage securities for financing. The chief purpose is to reduce distances of the Ironton road into Detroit. According to the map filed with the commission, the cut-off would be absolutely straight for the entire forty-three miles.

Pennsylvania to Improve Docks

The Pennsylvania R.R. will expend $500.000 in the improvement of its dock facilities at Erie, Pa., according to advice received in New York Dec. 13.

Coal Legislation Hopper

Two bills for the creation of a Department of Mines, with a Secretary and Assistant Secretary at its head, have been introduced in the Senate. One is by **Senator Oddie**, of Nevada, chairman of the Senate Committee on Mines and Mining, and the other is by **Senator Shortridge**, of California, and differs slightly from Senator Oddie's bill. Both measures have been referred to Senator Oddie's committee.

Representative Bacharach, of New Jersey, has introduced in the House a bill to improve the navigability of waters of the United States by preventing their pollution by oil.

Representative Davis, of Minnesota, has presented a bill proposing the establishment of an International Exposition of the United States of America, in the interest of mining, agriculture, labor, etc.

Representative Vinson, Georgia, has introduced a bill to amend the Interstate Commerce Act so that it would be unlawful for any rates, fares or charges to exceed those in effect on Feb. 28, 1920; also that "Nothing in the Transportation Act, 1920" shall diminish or extinguish the jurisdiction of any state or any agency thereof, of any common carrier or railroad, or the rates, fares, charges, classifications, regulations, or practices of any such carrier or railroad.

Representative Hawes, Missouri, has introduced a bill similar to one introduced by him in the last Congress, intending to create seven regional committees to consist of three members each, located in seven regions, practically similar to the regions in existence during governmental operation of the railroads. The Interstate Commerce Commission would remain at Washington under this bill as a sort of a Supreme Court of Commerce.

News Items From Field and Trade

ALABAMA

Recent incorporations in Jefferson County include the **Neill Coal Co.**, with a capital of $20,000, of which $8,000 is paid in, and of which John C., Ab. and H. C. Neill are the organizers.

The Hilliard Coal Co. is arranging to reopen its Hilliard mine, west of Jasper on the Frisco R.R., which has been idle for some time. The mine was developed some time ago at considerable expense and is owned by James Ensor, Brady Earnest and Manly Johnston, of Cordova, and T. B. Dilworth, of Jasper.

The Pratt-Warrior Coal Co., of Jasper, is making arrangements **to erect twenty-five new tenement houses** for employees at their Ivy Bluff Mines, in Walker County. The mines were recently leased to the Gulf States Portland Cement Co., of Demopolis, which is now operating them and taking the entire output. Motor haulage was recently installed in the mine and the new houses will enable the company to obtain additional employees for the increased output needed. The mines are located on the Warrior River, on which stream the plant of the cement company also is situated, and all coal is moved by barges to destination.

ILLINOIS

The Middle Fork Mine, one of the best and largest collieries near Benton, **owned by the United States Fuel Co., has been closed down,** throwing approximately 800 men out of work. The shutdown was brought about by a refusal of the "drivers" to take a small reduction in their daily wage, the company deciding it can buy coal cheaper than it can mine it under the present conditions, as the Standard Oil Co. decided at its two Illinois mines, now down. The output of the Middle Fork mine was used at steel plants operated by the company at Joliet.

Both shafts of the new Nason mine at Nason are now in coal. "B" shaft reached it Dec. 4 at 735 ft. About 150 ft. of main entry was driven in the first two weeks after the first shaft was finished. Development is going on day and night. "B" shaft, which measures 12 ft. 6 in. by 32 ft. 6 in., is one of the largest in the country and upward of 1,000 tons may be the daily tonnage by April 1. By Jan. 1, 1925, mine experts think this mine will break all records for quick development with a 5,000-ton daily output.

No direct responsibility has been placed yet for the flooding of the Radium mine at Belleville on Dec. 6. The report shows that the operators of the Chester mine, abandoned some 25 years ago, failed to chart its workings correctly. The survey of the coal leases held by the Radium mine indicated that there remained at least 500 ft. of coal between its nearest working face and the old mine. Evidence is reported to the effect that coal was taken long ago from leases not reported by the Chester mine. At present the pumping is equal to the rising water in the Radium shaft. The three bodies were recovered the day following the flood. New pumps are being installed that are expected to pump out both mines in two weeks' time and work will be resumed when an examination of the old mine is made to guard against a repetition of the accidental breakthrough.

Roscoe B. Starek has left the Binckley Coal Co. to become vice-president in charge of sales for the Leland Coal Co. of Chicago, a company which now holds Illinois, Indiana and Kentucky properties. H. A. Stark, long with the Bogle Coal Co. before L. G. Binckley acquired the Bogle properties in Indiana, now succeeds Mr. Starek as vice-president in charge of sales for the Binckley Coal Co.

The Quaker Mining Co., 37 West Van Buren Street, Chicago, has been incorporated by H. A. Huskey, George G. Haase and R. L. VanHoose.

A loss of $200,000 was suffered by the **Taylor Coal Co.** in its Dec. 1 fire, which destroyed the recently rebuilt washery and wooden tipple at Herrin.

M. F. Peltier, vice-president of the Peabody Coal Co., Chicago, returning from a trip of inspection among the Sheridan Coal Co. mines in Wyoming, said conditions in the coal industry in the West have seldom been less auspicious than they are now.

The appointment of a receiver for the Kolb Coal Co., of St. Louis, which was made on Oct. 16, was **vacated** ten days later by the Circuit Court of Appeals, at Chicago, which also ordered that the operation of the order for the appointment of the receiver and all proceedings thereunder should be stayed pending the hearing and determination of the appeal and that all property of the Kolb Coal Co. should be returned to it. The appointment of the receiver was made on the application of P. H. Sauter to the U. S. Court for the Eastern District of Illinois, against the coal company and others, the bill alleging that there was a dispute between the plaintiff and certain of the defendants relative to the ownership of 1,200 shares of the capital stock of the company. There were no allegations in the bill that in any way reflect upon the Kolb Coal Co. or its solvency or financial condition, and no relief of any kind or nature is sought against it.

The Kathleen mine, at Dowell, operated by the Union Colliery Co., of St. Louis, **smashed its own hoisting record twice in a week,** hoisting a total of 5,232 tons the second day and 4,902 the first day. The first record was made Dec. 12 and the second on the 14th. The mine has been in operation about four years and is expected to produce around 6,000 tons daily after development work has been fully extended. I. N. Bayless, of Dowell, is superintendent of the plant, and John Hays is mine manager.

IOWA

The C. M. & St. P. R.R. is building a double track spur one mile from its main line at Madrid, to the new mine of the Madrid Coal Co., which previously has been only a wagon operation.

Prof. S. W. Parr, of the University of Illinois, in an address before the Illinois and Iowa members of the American Chemical Society recently, enthused Iowa operators by **promising that Iowa would become one of the great fuel-producing** states of the country in the next fifteen to twenty years. He described low temperature carbonization, the best process by which the poor grade of coal that lies under twenty-three Iowa counties can be converted into high-grade coke—"the most desirable fuel in the world today"—and declared there is a great future for this process.

KENTUCKY

Harlan reports that the United Mine Workers have established an office in that town, and are working hard in an effort to unionize the southeastern Kentucky field, a drive having been under way in the Pineville district for some time, with recent discussion of moving district offices from Knoxville, Tenn., to Pineville.

W. B. Gathright, general manager of the Louisville wholesale and retail departments of the St. Bernard Mining Co. of Earlington, has resigned effective Jan. 1, after being with the company since he was a boy.

It is reported that **additional mines in the Harlan and Middlesboro districts have cut wages** during the past few days. Mines on Clover Fork are said to have been the first to cut, and reductions have been quite general of late as a result of many mines being down, hundreds of men out of work and others willing to accept cuts if it will keep them on the payroll.

An interesting Geological Survey report from Washington on Dec. 10, showed that **machine-mined coal in Kentucky ran much larger than most coal men believed,** the report showing 71 per cent, or 33,322,271 tons, machine cut out of 42,134,175 tons mined in 1922. A total of 5,355,037 tons, or 12.7 per cent, was shot off the solid, and 4.2 per cent, or 1,766,963 tons, was hand mined. Stripper operations in western Kentucky produced 468,845 tons, or 1.1 per cent, and 1,221,059 tons or 2.9 per cent carried no specification as to how it was mined.

The City of Henderson is now enjoying the cheapest coal in Kentucky. Last week a local mine reduced prices on lump from 18 to 16c.; nut from 18 to 15c. and slack from 10 to 8c., delivered. Prices are 3c. lower at the mine. The quotations are the lowest since 1916.

Illustrating the **coal-mining activity recently in Muhlenberg County,** Inspector M. H. Blythe's report shows that the Beech Creek Coal Co., of Drakesboro, opened a new mine, Beech Creek No. 3½, on the Louisville & Nashville last March. During September one mine shut down permanently because it was worked out—Williams No. 9, of the Beaver Dam Coal Co., of Beaver Dam—and in November four mines opened up. These were the Morrison and Curshaw strip properties of the Morrison Coal Co. and the Curshaw Coal Co., both of Centertown, and two mines belonging to the Beaver Dam Coal Co.—Sackett No. 9 and Black Cat No. 11, both at Beaver Dam. In that one county three strip mines opened during the summer and autumn. These were the Harris strip mine of the Harris Coal Corporation of Island, which began shipping on the L. & N. in June, and the two strippers mentioned earlier in this paragraph.

MISSOURI

Announcement has been made of the **sale of stock in the Central Coal & Coke Co. owned by C. F. Fox,** investment banker of Philadelphia, to a syndicate composed of Charles S. Keith, Kansas City, president of the company; Henry F. Hall, Kansas City, a director, and John Henry Kirby, of Houston, Texas. Mr. Kirby bought the greater portion of the stock sold. This consisted of the entire Fox holdings in the company, 11,675 shares. The price paid was $126 a share, or $1,471,050 cash for the entire transaction. "The deal gives the purchasers undisputed control of the company," Mr. Keith said. "Mr. Kirby bought the largest portion of the Fox interests. About 50,000 of the 70,000 shares of stock in the Central Coal & Coke Co. are now owned by Western men. There will be no radical change in policy. Mr. Kirby will take the place of Mr. Fox on the board of directors. The officers will remain the same." This is considered to dispose of the story that Eastern interests controlling the U. S. Distributing Corporation were to buy control of this coal company.

NEW YORK

The Mahoning Railroad Co., on Dec. 11 declared a dividend of $10 a share on its common stock, payable Dec. 28 to stockholders of record Dec. 21. Dividends of $10 a share were also paid in October, June and April of this year. In addition, the directors declared the regular semi-annual dividend of $2 a share. The regular quarterly dividend of $1.50 a share was also declared on the preferred stock.

A special meeting of stockholders of the Consolidation Coal Co. has been called for tomorrow to vote on **a proposed amendment to its charter** permitting a change in the par value of its capital stock and the issuance of $10,000,000 7 per cent cumulative, redeemable preferred stock, from the sale of which it is planned to reimburse the treasury of the company for capital expenditures in the acquisition of properties and to provide new working capital.

Directors of the Island Creek Coal Co., on Dec. 11 declared an extra dividend of $1 a share on the common stock of the company and the regular quarterly dividend of $2. The regular dividend of $1.50 a share was declared on the preferred. All dividends are payable Jan. 2 to stock of record Dec. 21.

Governor Smith on Dec. 11 appointed **a fair price coal commission for Poughkeepsie,** as follows: Clinton H. Laurence, representing the coal dealers; Otis Sherman, for the general public, and William T. Ward.

Emerson E. Davis of Saratoga Springs, has been appointed by Governor Smith as the third member of a fair-price coal commission for that city to serve with William E. Benton and Eugene E. Hayden, appointed by Acting Mayor Sherman. Mr. Benton is manager of a theater and Mr. Hayden is secretary of the Saratoga Coal Co., representing, respectively, the consumers and the coal dealers. Mr. Davis will represent the state.

OHIO

A new trial of the suit of the Hopper-Mankin Fuel Co. against the Matthew Addy Coal Co. has been asked in the U. S. District Court. The Hopper-Mankin company was denied judgment for $81,000 for coal delivered to the Matthew Addy Steamship Co., Judge Hickenlooper instructing the jury that the Matthew Addy company could not be sued for a debt contracted by the steamship company.

All bids, which were received by E. L. McCune, clerk of the Columbus Board of Education, Nov. 8, for furnishing and delivering 1,000 tons of Hocking nut, pea and slack to the site of the New Central High School, **were rejected** at a recent meeting **and will be readvertised.** The date as yet has not been set. The following were low bidders: Euga & Stinchcomb, $2.91; Reliable Coal & Supply Co., $2.98, and the J. C. McIntyre Coal Co., $3 per ton delivered.

OKLAHOMA

The International Fuel Corporation has taken over the Champion mine at Louisville, formerly operated by the Republic Fuel Co. This mine is not running at full capacity, but the operating company hopes to have a good output within the next few weeks.

A close examination of the coal deposits near Oklahoma City will be made by experts in the near future. It is believed that the examination will prove the existence of extensive deposits of high-grade coal. Coal was mined in the Fourteen Mile Creek locality many years ago and more recently work has been done by persons who leased a portion of land from Indian citizens. An attempt will be made to interest wealthy operators in the mining of the coal, in case a large deposit is found.

PENNSYLVANIA

Delegates representing the United Mine Workers of District No. 2, which includes practically all of central Pennsylvania, will go to the International convention in Indianapolis, Ind., on Jan. 17, standing behind two demands as to the next scale contract. **The first is for a six-hour workday and the second is for a 20 per cent increase in wages.**

By agreement of counsel at Sunbury on Dec. 4 the Lehigh Valley Coal Co., and the Susquehanna Collieries Co., in their appeal from assessments on anthracite lands in Northumberland County, which has been pending more than a year, it is announced that the former **will pay taxes on an increased valuation** of 40 per cent on approximately $15,000,000 worth of coal land; the Susquehanna on $11,000,000 worth. These appeals had been in the hands of the court for adjudication. The Philadelphia & Reading Coal & Iron Co. has already agreed to a 40 per cent rise in taxable valuation on $26,000,000.

Shipments of anthracite for the month of November, 1923, as reported to the Anthracite Bureau of Information, Philadelphia **amounted to 5,828,754 gross tons,** as compared with 6,564,526 gross tons during the preceding month, a decrease of 735,772 tons, or 11 per cent. This decrease can be attributed to holidays observed during the month. The average daily shipment for the time the collieries were in operation during the month of November exceeded that for the month of October. Comparing November shipments of this year with the corresponding month in 1921, the latest normal year, an increase of 514,740 tons is shown, or 9.7 per cent. Shipments by originating carriers were as follows:

	November 1923	October 1923
Phila. & Reading	1,038,340	1,205,425
Lehigh Valley	1,006,983	1,174,768
Jersey Central	493,915	564,471
Del., Lack. & Western	937,222	1,017,231
Delaware & Hudson	820,301	861,705
Pennsylvania	509,457	576,345
Erie	623,101	707,076
N. Y., Ont. & Western	153,075	174,707
Lehigh & New Eng.	246,360	282,798
Totals	5,828,754	6,564,526

The fire which recently damaged the plant of the **Phillips Mine & Mill Supply Co.,** Pittsburgh, was confined to one portion of the buildings and was not as serious as at first reported. The company announces that within a week or ten days it will be able to handle all business with its usual expedition and dispatch.

WEST VIRGINIA

Further trials of those who participated in the armed march against Logan in 1921 will be held in Fayette County, Monday, Feb. 11. There was a change of venue from Greenbrier to Fayette County in November. The first defendant to be placed on trial will be William Blizzard, president of subdistrict 2, of District 17, who is charged with being an accessory to murder. C. F. Keeney, president of the district, and Fred Mooney, secretary of the district, also are under indictment. The cases will be tried before Judge Early and it is expected that 250 witnesses will be in attendance, about 200 of whom will appear for the defense. Officials of the miners' union will be represented by H. W. Houston and T. C. Townsend, of Charleston. The state will be assisted in the presentation of its case by George Love, prosecuting attorney of Fayette County, and by C. W. Ossenton. Fayette will make the fourth county in West Virginia in which trials of some of the armed marchers have been held. The first trials were held in Jefferson. Then there was a change of venue to Morgan, then to Greenbrier and finally to Fayette.

Announcement has been made that the **Wheeling Steel Corporation is negotiating for 10,300 acres of coal land** in Mason County, extending from New Haven to Letart, on the Ohio River.

The Ideal Manufacturing Co., has just been organized by Charleston capitalists, and will establish a plant in Charleston. The company has been chartered with a capital stock of $5,000 for the purpose of manufacturing mining machines. Incorporators of the new company are John G. Bulmer, of Lory; James W. Smiley, S. L. Walker, A. S. Jenkins and R. Stewart, all of Charleston.

The Kelly's Creek Colliery Co., one of the large concerns operating in the Kanawha District, the main office of which is at Cleveland, has been granted authority **to increase its capital stock** from $1,900,000 to $2,000,000. The Paisleys, of Cleveland, are largely interested in this company.

Plans have been perfected for the erection in Huntington of the **Coal Exchange Building,** to cost approximately $1,000,000. It will contain 325 office rooms where many of the coal companies of the tri-state region will have headquarters, applications for space in the new building having been made even before construction work had been started. The building is to be thoroughly fireproof and is to be built of steel, terracotta, stone, concrete and brick. The Huntington Coal Exchange began to plan for the building about the time the coal exchange was organized.

WASHINGTON, D. C.

The new Senate Committee on Mines and Mining is composed of the following: Republicans—Oddie, Nevada, Chairman; Elkins, West Virginia, Phipps, Colorado, Cameron, Arizona, and Frazier, North Dakota; Democrats—Walsh, Montana, Ashurst, Arizona, Pittman, Nevada, and King, Utah. Senators Norbeck, South Dakota and Couzens, Michigan, Republicans, former members, were not retained, and all of the Republicans except Senator Oddie are new on the committee. Senator King is a new Democratic member on the committee.

Senator Borah, Republican, Idaho, is chairman of the Senate Labor Committee, new members of which are Brookhart, Iowa, and Dale, Vermont, Republicans; and Ferris, Michigan, and Copeland, New York, Democrats. Senators dropped from this committee are Warren Wyoming; Shortridge, California; Republicans; and McKellar, Tennessee, Democrat.

The U. S. Supreme Court on Dec. 3 **reaffirmed the decision** it handed down in June **declaring unconstitutional the West Virginia law which would compel natural-gas companies piping gas from that state to supply needs within the state before sending gas into other states in periods of shortage.** The vote of the court was five to three, one justice not participating, as was the case in the original decision. In its original decision the court declared that natural gas which has been piped into other states assumes the character of interstate commerce. A rehearing was granted West Virginia. The latest opinion merely recites that nothing was presented to change the first opinion of the court. The decision was on consolidated suits brought by Pennsylvania and Ohio against West Virginia.

President Coolidge has sent to the Senate the names of **Mark W. Potter,** of New York, and **Frank McManamy,** of the District of Columbia, **as members of the Interstate Commerce Commission** for seven-year terms beginning Jan. 1 next.

CANADA

William and George Hastings, members of the coal firm of Hastings & Sons, Woodstock, Ont., were fined $25 and costs each at an adjourned sitting of the police court for having **sold as coming from Alberta coal mined in the United States.** The difference in the price was refunded by the company to those who had purchased the coal.

If Canada consumed coal from Alberta instead of going outside the Dominion for it, **60,000 jobs at $1,500 per annum each would be maintained,** according to Commissioner Howard Stuchbury. "We are paying out each year the equivalent of $300,000,000, or the equal of the national debt in eight years," he said. "The West cannot pay its debts to Ontario because it has no money and, therefore, cannot buy Eastern products. But it has the coal wherewith to pay. Premier Ferguson stated recently that we are going to get a rate on Alberta coal before we are through."

Association Activities

The Northern West Virginia Coal Operators Association has filed with the Interstate Commerce Commission a brief urging adherence to its original decision in the assigned-car case. It is declared in the brief that the decision of last June is sound and logical inasmuch as it assures equality of treatment to all shippers regardless of size and power. It is pointed out that mines having cars assigned to them are afforded a full supply, reduce the cost of production at such mines, but cause an increase in the cost of production at other mines. The Association, through its executive vice president, George S. Brackett, also is actively opposing any change in the rates through the Potomac Yards, near Washington, in conjunction with the Upper Potomac Association.

The annual meeting of the **Winding Gulf Operators Association** held at White Sulphur Springs, W. Va., on Dec. 12, was featured by an address by H. L. Gandy, executive vice president of the National Coal Association. E. E. White, president of the E. E. White Coal Co., of Glen White, was chosen as president of the association for the fifteenth consecutive year. Other officers chosen were: P. M. Snyder, Mt. Hope, W. Va., vice president; George Wolfe, of Beckley, W. Va., secretary; A. W. Laing, of MacAlpin, W. Va., treasurer; members of executive committee, E. E. White, P. M. Snyder, A. W. Laing, W. G. Caperton, of Slab Fork; C. H. Mead, of Beckley, W. Va.; George R. Collins, of Charleston; Fred G. Wood, of Amigo, W. Va.; W. B. Beale, of Fireco, W. Va.; F. W. Lee, of Alpoca, W. Va.; W. H. Ruby, of Whitby, W. Va., and T. H. Wickham, of Beckley. Mr. Gandy reviewed the present coal situation and the prospect of legislation affecting the industry. He expressed himself as strongly opposed to any organization which attempted to set itself above the law. In calling attention to the present oversupply of coal, he stressed the necessity of being in a position to produce the peak load. The association endorsed the efforts to obtain such rates that would permit the movement of smokless to Eastern states by rail.

Coming Meetings

Tug River Coal Operators' Association. Annual meeting Jan. 4, 1924, Bluefield, W. Va. Secretary, C. C. Morfit, Welch, W. Va.

New England Wholesale Coal Association. Annual meeting Jan. 8, 1924, Boston, Mass. Secretary, R. S. Townsend, Boston, Mass.

Engineers' Society of Western Pennsylvania. Annual meeting Jan. 15, 1924, Blue Room, William Penn Hotel, Pittsburgh, Pa. Secretary, K. F. Treschow, Pittsburgh, Pa.

American Wood Preservers' Association. Annual meeting Jan. 15-17, 1924, Hotel Buehlebach, Kansas City, Mo. Secretary, P. R. Hicks, Chicago, Ill.

Northeast Kentucky Coal Association. Annual meeting Jan. 24, 1924, Ashland, Ky. Secretary, C. J. Neekamp, Ashland, Ky.

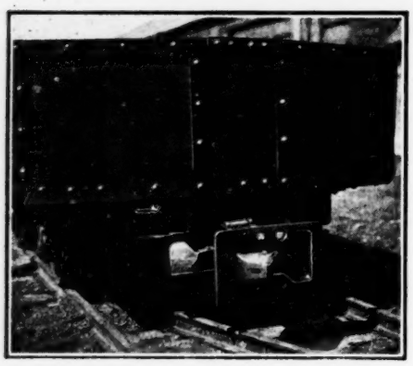
New Equipment

Automatic Mine-Car Coupler

The introduction and use of heavy all-steel mine cars of four tons or more capacity together with corresponding increase in size of all other equipment, such as rotary dumps, hoists, haulage locomotives, etc., has been effected with a view toward efficient high-speed production and low cost per ton.

During this period of development considerable time and study have been given to almost every detail connected with the production of coal, many machines having been perfected to operate with complete automaticity. The Ohio Brass Co. has, therefore, developed the Tomlinson automatic coupler for use on mine cars. This coupler has been applied to steam and electric railways for many years.

The coupler is completely self-contained, having no loose parts to become mislaid or lost. It is always ready for coupling either on straight track or curves, thus eliminating the necessity of anyone stepping between the cars



CAR WITH AUTOMATIC COUPLER

to adjust any part of the coupler. Heavy steel draft gear relieves the car body from abuse and shocks, thus prolonging the life of the equipment. A ball and socket type of anchorage permits operation of the car on a rotary dump, and ready means for uncoupling and transposing from a coupler to a bumper makes it suitable for hoisting operation.

Safe Blasting-Cap Container

Built like the cartridge chamber of a six-shooter, the new du Pont blasting cap container, illustrated here, is the most recent blasting accessory offered by the duPont Company. It meets a real need of blasters who, for lack of a service container, have heretofore carried detonators loosely in their pockets or in the tin boxes in which they are sold. This practice has frequently resulted in serious and sometimes fatal injuries. By the use of this new device the likelihood of such accidents will be greatly minimized.

The body of the container is made of vulcanized rubber. Drilled at regular intervals into its thick side walls are ten holes, each large enough to

CONTAINER FOR BLASTING CAPS

accommodate a blasting cap. The polished brass top cannot be removed, but can be rotated around the rivet pin which firmly secures it, so that the vent exposes the ten compartments one at a time. You fill the container with blasting caps just as you would load a six-shooter with cartridges. After filling, the top can be turned so that the vent is effectually closed over a blind hole. Incidentally, this top is designed to prevent accidental turning.

The legend — "Blasting Caps — Dangerous — Handle Carefully" — is embossed in white letters on the back of the container along with the following safety rules:

Do not remove caps with wire or nail.

Don't tap or otherwise investigate them.

Don't carry caps loose in pocket.

Don't store in residence.

Don't smoke near caps.

Don't shoot into caps.

Attach caps to fuse with cap crimper, not with knife or teeth.

Keep in a dry place.

Keep open lights away.

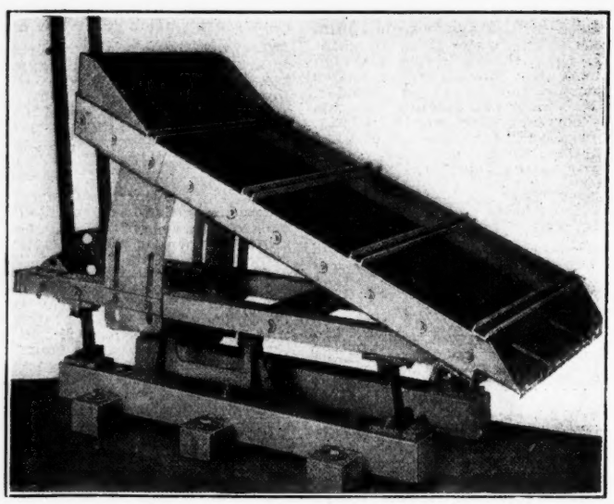
Containers are made for No. 6 caps and for No. 8 caps.

Screen That Both Shakes And Vibrates

Two types of a screen that both shakes and vibrates are made for either coarse or fine screening by the Southwestern Engineering Co., Los Angeles, Calif. It is used both for wet and dry material. When the material is dry and fine the screen may be enclosed so as to prevent dust from flying in the air and lighting on the sills, ledges and floor of the tipple or other building and air suction may be applied to draw away the finest particles.

This screen, which is known as the Cottrell, consists essentially of a screen frame or frames, rapidly vibrated by the rotation of an unbalanced pulley. Excessive speeds have not been found necessary, 400 to 1,000 r.p.m. being sufficient for practically every screening condition, according to the manufacturers. The screen cloth is said to last longer than in most types of screens because it is not put under great tension, for both the screen frame and the screen cloth are vibrated. For rough work, perforated metal screens may be used in place of screen cloth.

One, two or three screen decks may be used. The screen in type *A* can be set at angles from 10 to 30 deg. from the horizontal and it will therefore move at an angle to the screen frame. In type *B*, which may be used for any material coarser than 20-mesh and is run at 200 to 400 r.p.m., the screen has a motion at right angles to the screen surface. This bumping movement is ordinarily between one hundredth of an inch and 1½ in.



SCREEN WHICH SHAKES AND VIBRATIONS KEEP FROM CLOGGING